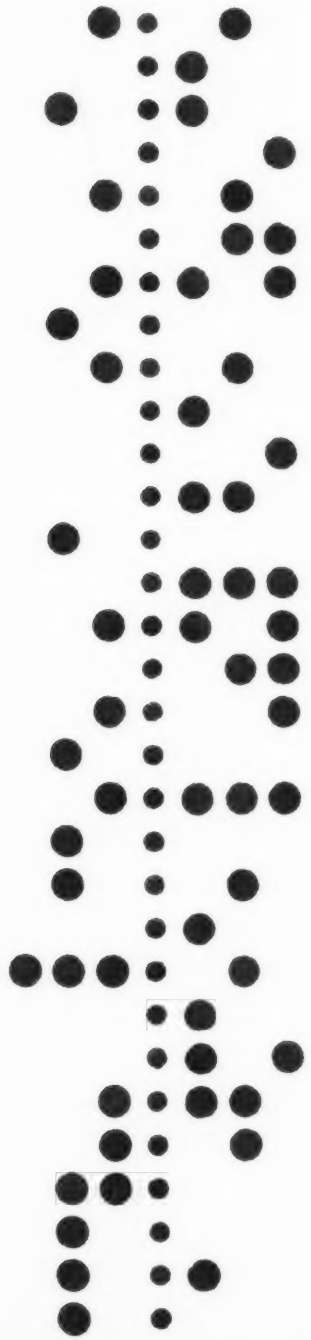
July 20, 1965

U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS



A Semi-monthly

Abstract Journal

for

Science and

Industry

CLEARINGHOUSE

FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

July 20, 1965 / Volume 40, Number 14

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

Issued twice a month by the Clearinghouse for Federal Scientific and Technical Information. Annual subscription $15 ($3.75 additional for foreign mailing). Single copy $1. Make remittance payable to Superintendent of Documents and mail either to a U.S. Department of Commerce Field Office or to Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. Address changes should be sent to Superintendent of Documents.

PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense and other Federal agencies. Included are reports from the Atomic Energy Commission and the National Aeronautics and Space Administration, which issue separate announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 22 major subject category headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in "Research Highlights."

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject category headings; the various indexes will aid in locating those reports. A single reference guide to new Government-sponsored technical literature, *Government-Wide Index to Federal Research and Development Reports*, is compiled monthly by the Clearinghouse from the combined indexes of this journal, *Nuclear Science Abstracts* (AEC), *Scientific and Technical Aerospace Reports* (NASA), and *Technical Abstract Bulletin* (DDC). This combined index is available from Superintendent of Documents, U.S. Government Printing Office, annual subscription $10, ($2.50 for foreign mailing) or $1.25 single copy.

TO ORDER REPORTS

All reports announced herein are available to the general public from the Clearinghouse, or in some cases from other sources as noted. To order Clearinghouse reports, use accession/report number (as given on the first line of each entry) and title from the Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, or from any Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given for each entry. Prepayment is required unless purchases are to be charged to Clearinghouse deposit accounts. Order forms will be found in the back. Make check or money order payable to National Bureau of Standards—CFSTI.

OTHER JOURNALS

Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. They are abstracted in the following journals available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS. National Aeronautics and Space Administration, $33.00 a year domestic, $42.00 foreign, $2.50 single copy plus 25 cents foreign mailing.

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated.
Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

NEW ANNOUNCEMENT CATEGORIES FOR USGRDR

Beginning with 5 July issue of USGRDR the subject arrangement for report announcements was changed to conform with the COSATI Subject Category List. The List has been prepared by the Task Group on Language Compatability operating under the direction of the Committee on Scientific and Technical Information (COSATI) as a uniform subject arrangement for 1) announcement and distribution of scientific and technical reports and 2) management reporting.

The List is a two-level arrangement consisting of 22 major subject fields further subdivided into 178 groups. The group structure is not presently used, but is included in the table of contents to provide some clarity to the major fields.

Adoption of the COSATI arrangement for the display of report announcements is in keeping with Clearinghouse interests toward achieving a more uniform system of subject categorizing report literature.

The COSATI list is not to be confused with the "industrial category list" now being used by the Clearinghouse in "Research Highlights" to group and announce R and D information under 49 categories that are of special current interest to industry.

NEW DEPOSIT ACCOUNT SYSTEM

Establishment of a new deposit account system for the purchase of Clearinghouse documents has become necessary because of the increased use of Superintendent of Documents deposit accounts for this purpose.

While deposit account customers may be inconvenienced initially, we believe that the new system, developed in cooperation with the Superintendent of Documents, will enable us to improve customer billing services and to process document orders more quickly and efficiently.

Changes in the system, effective July 1, are:

1. Clearinghouse purchases can no longer be charged to 'regular' Superintendent of Documents deposit accounts (numbered under 75,000), although these accounts should be maintained by customers who purchase documents from the Superintendent of Documents (GPO).

2. A "special" deposit account must be opened for the purchase of Clearinghouse documents--the account will be assigned a number above 75,000. This account can be used only for Clearinghouse documents.

3. To establish a Clearinghouse deposit account, send a minimum deposit of $25 to the Clearinghouse, U. S. Department of Commerce, Springfield, Virginia, 22151, ATTN: Code 410.60.

4. Once a month the Clearinghouse deposit account holder will receive a statement of his account showing the opening balance, the cost of orders completed, deposits received, and closing balance. In addition to the monthly statement, as each order is filled the customer will receive a receipted copy of our order control form showing documents shipped, total cost, and deposit account charge made.

5. Customers who do not wish to establish a Clearinghouse deposit account must send payment for documents with their orders.

We hope that customers will take advantage of the Clearinghouse deposit account system, since it will assist us in providing customers with accurate and fast service and it will reduce--for both customers and the Clearinghouse--the clerical work involved in handling orders.

RESEARCH highlights

Reports of current high industrial interest

Categories

	Page
Chemical Processing	iii
Chemicals	v
Coatings	v
Engineering and Construction	vi
Low-Temperature Materials and Processes	vi
Quality Control Standards, Specifications	vii
Semiconductors and Related Materials	viii
Transportation (Land, Sea, Air, Space)	viii

Chemical Processing

THERMODYNAMIC PROPERTIES OF AIR

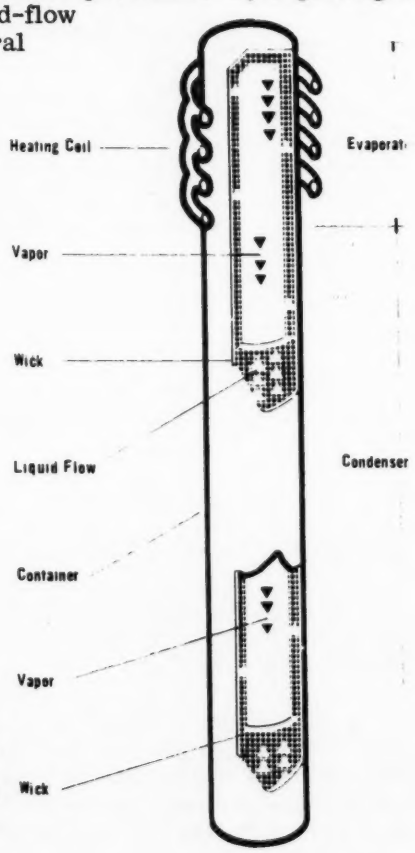
(Order AD-612 301 Tables of Thermodynamic Properties of Air in Chemical Equilibrium Including Second Virial Corrections From 1500°K to 15,000°K, HC $7.00/ MF $1.75.)

Tables of thermodynamic properties of air in chemical equilibrium have been compiled by the National Bureau of Standards for the Air Force. According to NBS, "The wide range of temperatures and densities over which the thermodynamic properties have been tabulated makes the tables useful in a variety of engineering design and test programs and in scientific research and development." The tables take into account the effect of dissociation and ionization, and the limiting-law Debye-Huckel and second virial corrections upon the thermodynamic properties and the equilibrium compositions. The work tabulates values from 1500°K in steps of 100°K to 15,000°K. It supercedes a 1963 publication of the same title.

NEW HEAT-TRANSFER DEVICE USES FLUID-FLOW SYSTEM

(Order LA-3211 High Thermal Conductance Devices Utilizing the Boiling of Lithium or Silver, HC only, $2.00.)

A new fluid-flow heat-transfer device with only a fraction of the weight of a solid conductor offers orders of magnitude greater heat-transfer characteristics, particularly in high-temperature applications. Developed by Los Alamos Scientific Laboratory for the AEC, the so-called Grover heat pipe appears to have great potential for the solution of heat transfer problems. By replacing the heat-flow mechanism of conduction with a fluid-flow system using latent heat, the device has several hundred times the thermal conductance per unit of any solid conductor. Because it is lightweight, has a high heat-transfer capability, and is capable of transferring heat with essentially no temperature drop, it is particularly suitable for space applications. However, there appear to be many other promising uses for heat pipes in situations requiring the transport of extremely high heat fluxes over wide temperature ranges. For example, the heat pipe, because of its ability to produce isothermal conditions over large areas, may be used for the determination of total emissivities of surfaces. The report of the device available at the Clearinghouse discusses this application, as well as use of the device in concentrating the relatively low flux densities of radioisotope heat sources into small areas for the production of high temperatures. The device is a self-contained thermal-conductance unit that has no moving parts, uses the heat being transferred for its operation, has a thermal conductance higher than any known material, and conducts heat with essentially no temperature difference. Heat is transferred by means of mass flow of a fluid, using the latent heat of a two-phase system. For high-temperature applications, two liquid metals--lithium and silver--have been tested and found suitable as heat pipe fluids.



The GROVER HEAT PIPE

Chemicals

MICROGRAM QUANTITIES OF SULFUR DETERMINED IN COMPOUNDS

(Order GAT-501 The Microdetermination of Sulfur in Uranium Compounds, HC only, $1.00.)

A novel and sensitive method for determining microgram quantities of sulfur in compounds can be used for analyzing a wide variety of materials. Originally devised for the AEC to analyze sulfur in uranium compounds, the method is "substantially more reliable than any other studied," according to the Goodyear Atomic Corp. developers, "particularly those in which sulfur is determined indirectly by its reducing power as a sulfide or turbidimetrically as a sulfate." In addition, the versatility and reproducibility is readily apparent with the error limitation being 8 percent in the 1 to 50 microgram range. The new method reduces and distills the sulfur as hydrogen sulfide from a mixture of hydrochloric, hyriodic, hypophosphorous, and phosphoric acids. The chemist then treats the distilled hydrogen sulfide with cupric ion in an acetate medium at pH 4.8 to 6.0 to produce the brown color of cupric sulfide. The color is sufficiently stable for a colorimetric determination of sulfur at a wavelength of 350 millimicrons. Nitrate is easily removed prior to the analysis so that it can't interfere with the determination. According to the Goodyear study, this method detects a minimum of 1 to 2 micrograms of sulfur while the limit of error in the 1-50 microgram range is 8 percent at the 95 percent confidence interval.

Coatings

LONG-LASTING STRIPE MARKING PAINT

(Order AD-614 784 Initial Field Testing of Airfield Marking Paints, HC $1.00/ MF 50 cents.)

Tests of airfield marking paints conducted by the Navy show that paints of vinyl toluene-butadiene have the least deterioration and are in relatively good condition after 1 1/2 years. An oleoresinous paint for stripes is in good condition after 6 months but shows a slow gradual loss of paint and slurry seal after this time. Test stripes near the center of the runway often have numerous black marks caused by the touchdown of aircraft, and have greatly reduced visibility as a result. The center, sideline, and end stripes have somewhat less initial edge cracking and lifting of paint and slurry seal, particularly when vinyl toluene-butadiene paint is used.

Engineering and Construction

CREEP IN CONCRETE

(Order AD-615 521 Study of Creep in Concrete, Phases 3, 4, and 5, HC $2.25/MF 75 cents.)

In a Navy study of creep in concrete tests were made to determine losses on small rectangular concrete beams loaded in compression by axial prestressing steel to about one-half of the recommended working stress. Navy engineers uncovered relationships which indicate it is feasible and practical to predict prestressing losses in full-size beams by testing small prestress beams of sufficient size variation to provide surface-area-to-volume values for extrapolation curves. The researchers also subjected cylindrical specimens to long-time compressive loading at 1 day of age, including 16 hours of steam curing. Creep and shrinkage of steam-cured concrete ranges from 25 to 46 percent less than that of the same concrete normally cured, the actual amount depending upon specimen size, applied stress, and storage humidity. Some of the tests also indicate that for a given concrete specimen, time-dependent strains are equal whether they are measured end-to-end or in the central portion of the specimen. The effects of age and of size and shape of specimen on shrinkage were determined by using cylinders, prisms, tee-sections, and I-sections. Shrinkage is affected by both size and shape. It was also determined that loaded and non-loaded concrete cylinders lose about the same weight of water when subjected to the same conditions. By the use of photoelastic coatings, it was disclosed that larger aggregate particles may contribute to some nonuniformity in strain distribution, but they do not seem to be the center of major strain concentrations. AD-611 138 STUDY OF CREEP IN CONCRETE, PHASE 1 (I-BEAM) AND PHASE 2 (HOLLOW-BOX BEAM) is also available, HC $1.00/MF 50 cents.

Low-Temperature Materials and Processes

FILAMENT-WOUND PLASTICS STRENGTHENED BY LOW TEMPERATURES

(Order N65-19921 Preliminary Investigation of Filament-Wound Glass-Reinforced Plastics and Liners for Cryogenic Pressure Vessels; HC $2.00/MF 50 cents.)

Low-temperature strength of certain filament-wound glass-reinforced plastics shows decided improvement as the temperature is sharply lowered from 75°F, according to NASA's Lewis Research Center. For example, a bidirectionally wound sheet material of E-801 glass has a composite tensile strength at 75°F of 91,000 psi, but increases 47 and 40 percent at -320 and -423°F. The material also appears to be relatively insensitive to sharp notches. The ratio of sharp-notch to smooth tensile strength at 75, -320, and -423°F is 0.89, 0.95, and 0.95. The composite tensile strength of a undirectional material of S-HTS glass wound in the form of NOL rings is about 297,000 psi at 75°F but increases 26 and 21 percent at -320 and -423°F. The tensile strength of bidirectionally wound material of E-HTS glass in the form of cylinders is 127,000 psi at 75°F but is 61 and 56 percent stronger at -320 and -423°F. Modulus of elasticity of E-HTS glass unidirectionally wound into the form of cylinders, which is about 8,500,000 psi at 75°F, however, shows insignificant increase at the two lower temperatures. This report is cited in this issue; see page S-30.

Quality Control Standards, Specifications

COMMERCE DEPARTMENT ISSUES STANDARDIZATION REPORT

(Order Report of Panel on Engineering and Commodity Standards of the Commerce Technical Advisory Board to the Assistant Secretary for Science and Technology, U.S. Department of Commerce, Section A, PB-166 811, HC $2.00/MF 50 cents; Section B, PB-166 812, HC $6.00/MF $1.50.)

The U.S. Department of Commerce is seeking comments from interested individuals and organizations concerning the LaQue report on standardization activities. This is the report prepared by the Panel on Engineering and Commodity Standards of the Commerce Technical Advisory Board. The major recommendation of the panel, which was composed of leading industrial technologists, was to establish a new Federally chartered Institute to coordinate voluntary standardization activities in the United States. The Panel emphasized that the development of standards should be left to the private organizations already active in this field. They were found to be competent and aware of the continuing need for a dynamic standards activity responsive to the requirements of modern society. Dr. J. Herbert Hollomon, Assistant Secretary of Commerce for Science and Technology, is writing to more than 150 technical societies, trade associations, professional organizations, consumer groups, industry groups, and other interested groups, asking for their comments on the recommendations of the LaQue Panel. The study group recommended that legislation be sought to create the new Institute, and that standards voluntarily developed by standards organizations and issued by the new Institute should be designated as "USA Standards." The report stated that preference should be given to reconstituting the existing national standards organization, the American Standards Association, rather than to creating an entirely new body.

INTRODUCTION TO TOLERANCE CHARTS

(Order RFP-432 Introduction to Tolerance Charts, an Elementary Treatment of Their Formation and Use, HC $3.00/MF 75 cents.)

The Dow Chemical Co. has prepared an introduction to tolerance charts for the AEC. The document discusses tolerance chart and process relationships, preparing the format, determining dimensions and tolerances for trace method, determining resultant dimensions, changing and correcting the chart, and salvaging substandard in-process parts. The publication notes that the two major roles of the tolerance chart are: (1) to aid in the development of the fabrication process, and (2) to provide an efficient means to follow up a process once devised. The chart is a means to an end, not an end in itself. Its intent is to aid in the development of a good process and can never become the cause for compromising a good process for the sake of an easy solution to a problem within the chart itself. However, the chart will bring to light any serious deficiency in a planned process before the fact. While the techniques and language of tolerance charts are well defined and specific, they are adaptable to a wide range of application. The standardization of the symbols, terminology, and graphic presentation permits universal understanding by manufacturing firms throughout the industrial community.

Semiconductors and Related Materials

FAILURE-ANALYSIS PROCEDURE FOR SEMICONDUCTORS

(Order SC-RR-65-137 Procedure for the Analysis of Semiconductor Failures, HC only, $1.00.)

A helpful failure-analysis procedure for semiconductors has been developed by Sandia Corporation. It involves taking definite steps in electrical testing, visual inspection, cold and pressure mounting, rough and fine polishing, and etching. Such analysis when correlated with use conditions and manufacturing variables can be a powerful tool in improving reliability. It normally will indicate whether the failure is due to misapplication or operating abuse, to poor workmanship or materials, or to inadequate device design. Attempts to postulate the failure mechanism on the basis of any one parameter can be grossly misleading, the researchers advise. For example, on a power transistor several unique mechanisms will yield a postfailure indication of a collector-to-emitter short, and a given device weakness or an overstress may result in any one of several mechanisms of failure indicators. Even the same mechanisms of failure can generate any one of several sets of postfailure indicators. This overlap of cause and effect relationships does not permit simple categorization of failure mechanisms and an over-all pattern of failure must be established if confidence is to be placed in the analysis.

Transportation (Land, Sea, Air, Space)

SUSPENSION SYSTEMS FOR CROSS-COUNTRY VEHICLES

(Order AD-612 144 Friction Hydro Pneumatic Suspension System, HC $1.00/MF 50 cents.)

It is feasible to design cross-country vehicles with a speed capability of 30-35 miles per hour within the present state-of-the-art of suspension systems, Army engineers report in a paper presented at the 1964 Army Science Conference. A suspension system incorporating a low spring rate and adequate damping will provide a significant reduction in pitch and bounce vibrations, thereby increasing vehicle cross-country speed capability without degrading the effectiveness of the crew or the vehicle's systems and equipment. The promising results achieved to date by Army researchers have already had a significant impact on the design of suspension systems for military vehicles.

SNOW REMOVAL AND ICE CONTROL

(Order AD-615 795 Cold Regions Science and Engineering. Part III, Section A3b, Snow Removal and Ice Control, HC $2.00/MF 50 cents.)

A monograph on snow removal and ice control prepared by the Army's Cold Regions Research and Engineering Laboratory reviews climatological aspects, properties of snow, and equipment for mechanical snow removal. The document also discusses snow plow design and plowing practices, ice control, melting chemicals and abrasives, highway design considerations, and thermal methods.

CONTENTS

Section I TECHNICAL ABSTRACT BULLETIN from Page 1 to 146 (Printed on white paper). Announces reports released to the public by the Defense Documentation Center. This section is followed by its indexes beginning on page A-1.

Subject Index A-1
Personal Author Index B-1
Corporate Author-Monitoring Agency Index C-1
Contract Index D-1
AD - Division Index E-1

Section II OTHER RESEARCH REPORTS AND RELATED MATERIAL from Page S-1 to S-49 (Printed on blue paper). Announces reports released by AEC, NASA and other civilian agencies and also certain older military reports. Included are AEC's Engineering (CAPE) Drawings, Government-Owned Patents and Privately-Owned Patents in the area of Lubricants. This section is followed by its indexes beginning on page

Subject Index S-51
Personal Author Index S-53
Corporate Source Index S-55
Contract Number Index S-57
Accession/Report Number Index S-59

SUBJECT CATEGORY HEADINGS APPLY TO BOTH SECTIONS

01 AERONAUTICS — Page No.

Includes aerodynamics; aeronautics; aircraft; aircraft flight control and instrumentation; and air facilities. See also related fields: 16 Missile Technology, 17 Navigation, Communications, Detection, and Countermeasures, 20 Physics, and 22 Space Technology..... 1, S-1

02 AGRICULTURE

Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry. See also related field: 06 Biological and Medical Sciences..... S-2

03 ASTRONOMY AND ASTROPHYSICS

Includes astronomy; astrophysics; and celestial mechanics..... 7

04 ATMOSPHERIC SCIENCES

Includes atmospheric physics and meteorology..... 9, S-2

05 BEHAVIORAL AND SOCIAL SCIENCES

Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology. See also related field: 06 Biological and Medical Sciences..... 17, S-3

06 BIOLOGICAL AND MEDICAL SCIENCES

Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects. See also related fields: 02 Agriculture, 05 Behavioral and Social Sciences, and 07 Chemistry..... 28, S-12

07 CHEMISTRY

Includes chemical engineering; inorganic chemistry; organic chemistry; physical chemistry; and radio and radiation chemistry. See also related fields: 06 Biological and Medical Sciences, 11 Materials, 20 Physics, and 21 Propulsion and Fuels..... 42, S-14

08 EARTH SCIENCES AND OCEANOGRAPHY

Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism. See also related field: 04 Atmospheric Sciences..... 49, S-15

09 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes components; computers; electronic and electrical engineering; information theory; subsystems; and telemetry. See also related fields: 10 Energy Conversion (Non-propulsive) and 20 Physics..... 59, S-19

10 ENERGY CONVERSION (Non-Propulsive)

Includes conversion techniques; power sources; and energy storage. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 70, S-27

11 MATERIALS

Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products. See also related fields: 07 Chemistry, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 21 Propulsion and Fuels..... 74, S-28

12 MATHEMATICAL SCIENCES

Includes mathematics and statistics and operations research. See also the specific field of application..... 83, S-33

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction equipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering. See also related fields: 07 Chemistry and 09 Electronics and Electrical Engineering..... 87, S-35

14 METHODS AND EQUIPMENT

Includes cost effectiveness; laboratories, test facilities, and test equipment; recording devices; reliability; and reprography..... 94, S-37

15 MILITARY SCIENCES

Includes antisubmarine warfare; chemical, biological, and radiological warfare; defense; intelligence; logistics; nuclear warfare; and operations, strategy, and tactics. See also related fields: 16 Missile Technology and 17 Navigation, Communications, Detection and Countermeasures..... 98, S-38

16 MISSILE TECHNOLOGY

Includes missile launching and ground support; missile trajectories; missile warheads and fuzes; and missiles. See also related fields: 01 Aeronautics, 17 Navigation, Communications, Detection, and Countermeasures, 19 Ordnance, 21 Propulsion and Fuels, and 22 Space Technology..... 100, S-38

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes acoustic detection; communications; direction finding; electromagnetic and acoustic countermeasures; infrared and ultraviolet detection; magnetic detection; navigation and guidance; optical detection; radar detection; and seismic detection. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 101, S-39

18 NUCLEAR SCIENCE AND TECHNOLOGY

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology. See also related fields: 07 Chemistry, 15 Military Sciences, 18 Nuclear Science and Technology, 20 Physics, and 21 Propulsion and Fuels..... 105, S-41

19 ORDNANCE

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance. See also related field: 18 Nuclear Science and Technology.....107, S-42

20 PHYSICS

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation. See also related fields: 03 Astronomy and Astrophysics, 07 Chemistry, 09 Electronics and Electrical Engineering, 10 Energy Conversion (Non-propulsive), 11 Materials, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 17 Navigation, Communications, Detection, and Countermeasures..... 109, S-44

21 PROPULSION AND FUELS

Includes air-breathing engines; combustion and ignition; electric propulsion; fuels; jet and gas turbine engines; nuclear propulsion; reciprocating engines; rocket motors and engines; and rocket propellants. See also related fields: 07 Chemistry and 20 Physics..... 138, S-46

22 SPACE TECHNOLOGY

Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support. See also related fields: 01 Aeronautics, 03 Astronomy and Astrophysics, 16 Missile Technology, 17 Navigation, Communications, Detection, and Countermeasures, and 21 Propulsion and Fuels.....142, S-47

TECHNICAL ABSTRACT BULLETIN

01. Aeronautics

AD-615 812 Div. 1/11, 1/5, 16/1
CFSTI Prices: HC$2.00 MF$0.50

Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
Final rept. for Mar 61-Jan 62,
by Hubert T. Davis and William C. Kaufman.
Dec 64, 43p AMRL TR-64-139
Projs. 7222, 1350, Tasks 722204, 135004
Unclassified report

Descriptors: (*Cockpits, Thermal radiation), (*Thermal radiation, Cockpits), (*Pilots, Heat tolerance), (*Heat tolerance, Pilots), Aviation safety, Fire safety, Aircraft canopies, Loading(Mechanics), Flight clothing, Nuclear weapons, Fighters, Bombers, Nuclear explosion damage, Fracture(Mechanics), Acrylic resins, Materials, Simulation, Stress(Physiology).

The maximum thermal radiation load to which the cockpit of a fighter-bomber may be safely subjected was determined experimentally. Fighter-bombers delivering nuclear weapons under cloud conditions may encounter these thermal radiation loads. A static F-100C cockpit was the test vehicle and four human subjects dressed in full flying equipment were exposed in it to thermal pulses simulating those of nuclear detonations. An unprotected cockpit and pilot can be safely subjected to a range from 3 to 5 cal/sq. cm. if the yield of the weapon is approximately one megaton. This limit assumes adequate protection for the pilot's eyes. Materials in an unoccupied, unprotected cockpit will smoke profusely and char (but not flame) under a load of approximately 10 cal/sq. cm. Partial cracks will form in the plexiglass canopy under an absorbed load of approximately 11 cal/sq. cm. (Author)

AD-615 818 Div. 33/1, 6/6, 19/3
CFSTI Prices: HC$2.00 MF$0.50

Airborne Instruments Lab., Inc., Deer Park, N. Y.
HEIGHT CODE TABLES FOR USE WITH AIR TRAFFIC CONTROL RADAR BEACON SYSTEM,
May 62, 42p Rept. no. 8893-SP-1
Contract FAA/BRD329, Task 6
Unclassified report

Descriptors: (*Air traffic control systems, Height finding), (*Height finding, Air traffic control systems), (*Radar beacons, Air traffic control systems), Data transmission systems, Electromagnetic pulses, Digital systems, Tables.

The Seventh Communications Division of the International Civil Aviation Organization (ICAO) has recommended the adoption of a digital code for automatic height transmission via the AIR TRAFFIC CONTROL RADAR BEACON SYSTEM. Salient features of the code are (1) One-hundred-foot digitizing increments; (2) Range from -1000 feet to +126,750 feet; (3) Compatibility with limited-capability 500-foot incremented code; (4) Unambiguous unit-distance characteristic; (5) Height transmission with respect to a fixed datum of 1013.2 millibars (29.92 inches of mercury). The code, as recommended by ICAO, is tabulated for height increments in increasing numeric order and for the equivalent octal Mode 3/A reply in increasing numeric order. The PULSE POSITIONS column lists the time-sequence assignment of the pulse-transmission reply, and the HEIGHT CODE POSITIONS column gives a rearrangement of the code information in significant-digit sequence. Five-hundred-foot increments are extracted from the tables by omitting the C information pulses for the appropriate integer multiple of 500-foot height. (Author)

AD-615 893 Div. 1/4

Bell Aerosystems Co., Buffalo, N. Y.
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT,
by R. E. Carroll and C. H. Tyler. 15 Mar 53,
207p Rept. no. 02-984-009
Contract AF33 038ac20663
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Approach, Optimization), (*Aircraft, Approach), Airframes, Ailerons, Aerial rudders, Control systems, Systems engineering, Landings, Performance(Engineering).

The report presents theoretical analyses, based on analog computation, leading to the development of an optimum control system for the final approach maneuver of two very different airframes: the F-80 and the C-47. The study was limited to the use of the aileron and rudder for lateral control; thrust (power) and elevator for vertical control. The use of variable flaps, etc., was not considered. Criteria for competitive comparisons of control systems are postulated under the assumptions of perfect servos, positional data, etc. Aerodynamic coefficients, equations of motion, and computation circuits are developed for the airframes. Various types of possible automatic controls were systematically investigated. The control system which best meets the criteria was determined and is described; it will be referred to as the Optimum System. The Optimum System includes both the lateral and the longitudinal optimum controls and applies to both airframes although the gains on some of the control signals differ slightly. Analytic idealizations of several autopilot systems in present use are compared with each other and with the Optimum System relative to their performances in the final landing approach. It is found that the Optimum System appears slightly better than the others in response to commands and appreciably better in its behavior in gusts. (Author)

AD-615 901 Div. 9/6
CFSTI Prices: HC$2.00 MF$0.50

Cincinnati Univ., Ohio.
NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
Interim technical rept.,
by Kinzo Hida. Jan 65, 27p
Contract AF33 616 8453, Proj. 7064
ARL 65-15 Unclassified report

Descriptors: (*Hypersonic flow, Blunt bodies), (*Blunt bodies, Hypersonic flow), Two-dimensional flow, Delta wings, Differential equations, Shock waves, Incompressible flow, Series, Numerical analysis.

Hypersonic flow past a two-dimensional blunt body was treated by making use of the technique of the perturbation of independent variables. Application to a flat plate normal to the oncoming flow leads us to the same results as those obtained by Cole and Brainerd due to a different procedure. One more term is found for the stand-off distance of a shock wave. The case past an arbitrary body is also considered. (Author)

AD-615 902 Div. 9/6, 30/2
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor.
A DIGITAL COMPUTER PROGRAM FOR CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS,
by Leonard J. Harding. Mar 65, 83p
Contract AF33 657 8867, Proj. 7116, Task 711601
ARL 65-58

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Condensation, Aerodynamic characteristics), (*Programming(Computers), Condensation), Gas flow, Digital computers, Nozzles, Iterative methods, Mathematical models, Nucleation, Equations.

The report describes a digital computer program for calculating vapor condensation processes that occur in rapidly expanding flows. The treatment emphasizes the program logic required to satisfy the requirements of the mathematical model. Among the most important of these requirements are the search for the onset of nucleation, in an isentropically expanding flow, and the iteration procedure necessary for the joint solution of the nucleation and growth equations and the diabatic flow equations. The program features flexibility in allowable input conditions, short execution time, and a convenient output format. (Author)

AD-615 904 Div. 9/7
CFSTI Prices: HC$3.00 MF$0.75

Aerophysics Lab., Mass. Inst. of Tech., Cambridge.
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK: PHASE II,
by Robert J. Polutchko and Bror O. Hultgren.
Dec 64, 62p
Contract AF33 616 7818, Proj. 7064
ARL 64-214

Unclassified report

Descriptors: (*Hypersonic flow, Nose cones), (*Nose cones, Hypersonic flow), Blunt bodies, Shock waves, Angle of attack, Wings, Thermodynamics, Schlieren photography, Pressure, Aerodynamic loading, Graphics.

The report describes Phase II of an experimental research program to investigate the flow fields about blunt nosed wings and bodies at angle of attack. Phase II is an investigation of the inviscid three-dimensional flow field about a truncated 10 degree half-angle cone at Mach numbers of 4.07 and 7.6 and angles of attack up to 20 degrees. By traversing the flow between the body and the bow shock with a conical probe at various cross-flow planes the thermodynamic state variable and Mach number profiles are established for each angle of attack. Schlieren photographs of vertical meridian shock wave shapes were taken. Estimates of the three-dimensional shock locus are included. (Author)

AD-615 908 Div. 1/6, 18/3
CFSTI Prices: HC$3.00 MF$0.75

Ryan Aeronautical Co., San Diego, Calif.
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM.
Final program summary rept.,
by N. Sakamoto and G. Cota. May 65, 81p
Rept. no. 64B120
Contract DA44 177AMC868T, Proj. 1D121401A14172
TRECOM TR-65-11

Unclassified report

Descriptors: (*Gliders, Transport planes), (*Helicopters, Towing vehicles), Flight testing, Feasibility studies, Flexible structures, Towing cables, Wings, Logistics, Take-off, Landings.

The results of a flight test program utilizing a flexible wing air cargo delivery vehicle are presented. The objective of the program was to prove the feasibility of this vehicle for the delivery of cargo in a logistic system. Discussed are performance characteristics and handling qualities of both the towed flexible wing and the tow helicopter.

AD-615 922 Div. 1/9, 9/7
CFSTI Prices: HC$3.00 MF$0.75

Aeroelastic and Structures Research Lab., Mass. Inst. of Tech., Cambridge.
AN EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
Final technical rept. for 1 Mar 63-31 Aug 64,
by Norman D. Ham and Paul A. Madden. May 65 60p
ASRL-TR-117-1
Contract DA44 177AMC22T, Task 1P1215901A14203
USAAML TR-65-13

Unclassified report

Descriptors: (*Rotor blades(Rotary wings), Aerodynamic loading), (*Aerodynamic loading, Rotor blades(Rotary wings)), Vibration, Experimental data, Aerodynamic configurations, Helicopter rotors.

Experimental airload harmonics from the first to the tenth at various blade spanwise stations are presented for single and rear tandem rotor configurations for various rotor angles of attack, tip-speed ratios, and thrust loadings. The results include the effect of blade bending motion on airload harmonics for selected test cases. Evaluation of the experimental results indicates several general conclusions of importance with regard to vibration levels of compound helicopters, tandem helicopters, and three- and four-bladed rotors. (Author)

AD-615 928 Div. 1/2, 9/7, 30/4, 30/6
CFSTI Prices: HC$2.00 MF$0.50

Mississippi State Univ., State College.
THE MARVEL PROJECT. PART E. A UNIQUE SOLUTION TO THE PROBLEM OF OBTAINING TWO-DIMENSIONAL BOUNDARY LAYER DATA ON THE VARIABLE-CAMBER HIGH-LIFT WINGS OF THE MARVELETTE AIRCRAFT.
Aerophysics Research rept.,
by Sean C. Roberts. May 65, 34p
Rept. no. RR-56
Contract DA44 177AMC892T, Task 1D121401A14203
TRECOM TR-65-16

Unclassified report

See also AD-608 187.

Descriptors: (*Wings, Aerodynamic configurations), (*Research planes, Test facilities), Wind tunnels, Lift, Design, Construction, Instrumentation, Tests, Turbulent boundary layer, Camber, Shrouded propellers, Thrust, Effectiveness, Costs, Two-dimensional flow, Flight, Simulation.

The paper reports on the design, construction, instrumentation and preliminary testing performed on the high-lift wing of the MARVELETTE aircraft in a two-dimensional wind tunnel. The wind tunnel, 12 feet high and 2 feet 9 inches wide was fitted over a section of the aircraft wing to the shrouded propeller at the rear of the vehicle. When operating with this arrangement, wind tunnel velocities up to 60 miles per hour were obtainable in the test section. The tunnel provided more data in a few weeks of operation than would have been obtained in a number of months using a flight program with a considerable number of flights close to minimum flight speeds. (Author)

AD-615 933 Div. 9/7, 9/6, 25/3
CFSTI Prices: HC$3.00 MF$0.75

Cincinnati Univ., Ohio.
RECENT RESULTS IN THEORETICAL AND EXPERIMENTAL HYPERSONICS AND THEORETICAL MAGNETOHYDRCDYNAMICS.
Final summary rept. for 1 Jul 61-30 Jun 64.
Jan 65, 69p
Contract AF33 616 8453, Proj. 7064
ARL 65-18
Unclassified report

Descriptors: (*Hypersonic flow, Scientific research), (*Magnetohydrodynamics, Scientific research), Theory, Three-dimensional flow, Shock waves, Conical bodies, Airfoils, Wake, Boundary layer, Aerodynamic characteristics, Equations, Hypersonic wind tunnels, Compressible flow, Angle of attack, Delta wings, Transducers.

The theoretical investigation includes three dimensional hypersonic flow problems, shock interaction studies, weak interacting hypersonic flow over cones, hypersonic leading edge problems, wake problems, and an analysis of binary boundary layer problems. Additionally, a method is reviewed whereby the equations of a steady, two-dimensional compressible, isentropic flow of a perfectly conducting gas with an aligned magnetic field can be reduced to those of the conventional non-magnetic case. The experimental portion of the investigation was conducted in a Mach 14, twenty-inch hypersonic wind tunnel. Topics investigated include the hypersonic wake problem, shock interaction, hypersonic flow over cones at low and high angles of attack, hypersonic inlet problems, hypersonic flow over flat plates with and without a glow discharge, and flow over delta wings at high angles of attack. Brief descriptions of the calibration of the above mentioned tunnel and evaluation of instrumentation used in conjunction with the tunnel are also included. (Author)

AD-615 944 Div. 9/6
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER,
by Ting Y. Li and Joseph F. Gross. Apr 65, 48p
Rept. no. P-2977-1
Unclassified report

Descriptors: (*Hypersonic flow, Mathematical analysis), (*Slender bodies, Hypersonic flow), (*Bodies of revolution, Hypersonic flow), Boundary layer, Transport properties, Laminar boundary layer, Compressible flow, Transformations(Mathematics).

The purpose of the paper is to present an analytical formulation of the problem of hypersonic viscous interaction on a very slender body of revolution having a thick boundary layer and with surface mass transfer. Particular attention is directed to establishing the mathematical restrictions necessary for the existence of similar solutions of the laminar boundary layer equations for this class of problems.

AD-615 993 Div. 1/4
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
IN AIR TURBULENCES,
by B. Nikitin. 7 May 65, 8p FTD-TT-64-1360
TT 65-62419
Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) 12 Jul p4 1964.

Descriptors: (*Turbulence, Maneuverability), (*Maneuverability, Aircraft), Navigation, USSR.

AD-616 102 Div. 9/7
CFSTI Prices: HC$1.00 MF$0.50

Brown Univ., Providence, R. I.
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION,
by Floyd B. Hanson and Peter D. Richardson.
Apr 65, 17p
Contract AF33 615 1263, Proj. 7063, Task 706301
ARL 65-72
Unclassified report

Descriptors: (*Stagnation point, Turbulence), (*Cylindrical bodies, Fluid dynamic properties), Velocity, Vortices, Wake, Boundary layer, Reynolds number, Experimental data, Anemometers.

Hot wire measurements of mean velocity and turbulent velocities were made on an upstream centerline from a 2.5 in. diameter horizontal cylinder. At .3 diameters from the stagnation point the mean velocity showed a sudden 'kink' deviation from theory prediction. It took about 3 diameters for recovery to the theoretical value. The 'kink' region also had peak turbulence intensity about double the expected value. The high energies in this region occurred at relatively long periods 50 to 60 m sec. Within the stagnation boundary layer the periods were 100 to 150 m sec. The 'kink' region showed only very short bursts of Strouhal frequency so that a tie-up of this phenomena to wake characteristics is rather doubtful. The need for further measurements including simultaneous hot wire systems is clear. (Author)

AD-616 104 Div. 1/9, 1/4
CFSTI Prices: HC$5.00 MF$1.00

Kaman Aircraft Corp., Bloomfield, Conn.
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION.
Final rept.,
by A. A. Whitfield and W. E. Blackburn. Mar 65,
178p Rept. no. R-527B
Contract DA44 177AMC105T, Task 1D121401A152
TRECOM TR-65-14 Unclassified report

Descriptors: (*Helicopters, Thrust), (*Jet planes, Helicopters), Flight testing, Helicopter rotors, Rotary wings, Vibration, Jet engines, Airspeed, Aerodynamic loading, Stability.

The results of a flight research program conducted to determine the behavior of a fully articulated, servo-flap controlled rotor system at various power levels in high-speed flight are presented. The research aircraft, instrumentation, and test program are described. A standard Kaman UH-2 helicopter was modified by the addition of a General Electric YJ-85 jet engine, without afterburner, mounted on the right side of the fuselage for horizontal thrust augmentation. Research flights were conducted up to a level-flight true airspeed of 188 knots. Airspeeds limited by retreating blade stall or advancing blade compressibility were established. The effects of density altitude, rotor speed and power, tip speed ratio, thrust augmentation and aircraft gross weight on the limit airspeeds are discussed. It is concluded that the speed envelope for rotary wing aircraft can be substantially expanded by unloading the main rotor through the application of horizontal thrust augmentation. (Author)

AD-616 105 Div. 1/2, 11/4
CFSTI Prices: HC$3.00 MF$0.75

Goodyear Aerospace Corp., Akron, Ohio.
TEST AND EVALUATION OF AN M-151 AIR CUSHION CONVERSION KIT.
Rept. for Apr-Dec 64,
by L. L. McFarland. May 65, 69p GER-12121
Contract DA44 177AMC143T, Task 1D021701A04814
USAAML TR-65-19

Unclassified report

Descriptors: (*Ground effect machines, Tests), Mobile, Vehicles, Terrain, Water, Performance(Engineering).

The report describes the results of a test program conducted to evaluate an air cushion kit for the M-151 jeep. The kit utilizes air cushion principles to increase mobility in low-bearing terrain. Quantitative tests were conducted in soft clay with a cone index of less than 30, and on a hard surface. In addition, qualitative tests were conducted in water and over varied terrain. Tractive effort was shown to decrease as cushion pressure increased, and the vehicle was successfully operated in water and over varied terrain. (Author)

AD-616 109 Div. 9/5
CFSTI Prices: HC$2.00 MF$0.50

Gas Dynamics Lab., Northwestern Univ., Evanston, Ill.
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
Interim rept. for 1 Dec 63-1 Jun 64,
by David C. Smith and Ali Bulent Cambel. Apr 65, 39p
Contract AF33 615 1160, Proj. 7063, Task 706303
ARL 65-67

Unclassified report

Descriptors: (*Laminar flow, Jets), (*Jets, Laminar flow), Axially symmetric flow, Compressible flow, Temperature, Momentum, Energy, Numerical analysis.

Existing solutions to the laminar, axially symmetric jet problem are restricted by assumptions of constant viscosity, constant density and a unitary Prandtl number. Some perturbation solutions for compressible jets with a unitary Prandtl number can also be found. For heated jets, both the viscosity and the density can vary over a wide range of values and the assumptions that they are constants are no longer applicable. For extremely hot jets, the Prandtl number is decreased due to ionization and the assumption of a Prandtl number of one is even less applicable in this case than in ordinary gas dynamic flows. The laminar, compressible, axially symmetric jet problem is solved analytically for a variable viscosity and an arbitrary Prandtl number. The flow is assumed subsonic where compressibility is due to heating only. The viscosity is assumed to be directly proportional to temperature to the one-half. This viscosity-temperature relationship is found to be in good agreement with existing theoretical calculations. An approximation is required to obtain the analytical solution and an a posteriori check shows that it introduces a negligible error. The applicability of the solution to arc heated argon plasma jets is discussed. The assumptions required to solve the problem are very accurate up to a temperature of 7500K for argon at atmospheric pressure. The solution should give a good indication of the enthalpy profiles at higher temperatures. (Author)

AD-616 128 Div. 1/3, 14/8
CFSTI Prices: HC$2.00 MF$0.50

Army Aviation Materiel Labs., Fort Eustis, Va.
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
Engineering rept.,
by E. Rouzee Givens. May 65, 50p
USAAMI TR-65-39
Task 1P121401A14176

Unclassified report

Descriptors: (*Isocyanate plastics, Rotary wings), (*Plastic coatings, Rotary wings), (*Rotary wings, Isocyanate plastics), Erosion, Wear resistance, Abrasives, Adhesives, Helicopters, Protective treatments, Desert tests.

The report covers the use ot PO 655 polyurethane material as an erosion resistant boot for the protection of helicopter rotor blades. Two adhesive systems were used with the polyurethane boots, and tests were conducted on CH-34 and UH-1B/D main rotor blades to evaluate the survivability of the material in an abrasive environment. (Author)

AD-616 186 Div. 9/7

California Inst. of Tech., Pasadena.
MEASUREMENTS OF FLUCTUATING AIR LOADS ON A CIRCULAR CYLINDER.
Revised ed.,
by L. V. Schmidt. 25 Sep 64, 7p
Grant NSF GP303

Unclassified report

Pub. in Journal of Aircraft v2 n1 p49-55 Jan-Feb 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cylindrical bodies, Aerodynamic loading), (*Aerodynamic loading, Cylindrical bodies), Lift, Drag, Measurement, Reynolds number, Separation, Three-dimensional flow, Statistical analysis, Vortices.

Measurements were made of the unsteady air loads, both lift and drag, developed on a circular cylinder when exposed to flow normal to the axis of symmetry in the supercritical Reynolds number range from 0.38 X 1000000 to 0.75 X 1000000. The three-dimensional nature of the flow, which is a consequence of the separated viscous flow, is recognized. A statistical description of the spatially varying random-type air

loads is provided by cross-spectral densities and cross-correlation coefficients. Information of this type, when defined in detail, has application to the response problem of a cylindrical structure that is exposed to air loads. An unusual trait that was observed was the extreme sensitivity of the flow to surface irregularities in the supercritical Reynolds number region. In addition to an influence upon the local and spatial character of the fluctuating loads, steady-state values of local lift could be induced by suitably orienting surface disturbances on the forward portion of the cylinder. (Author)

AD-616 204 Div. 9/6

Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
THE VORTICAL LAYER ON AN INCLINED CONE,
by Albert G. Munson. 20 Mar 64, 17p
Grant AF AFOSR96 63
AFOSR 65-0920

Unclassified report

Pub. in Journal of Fluid Mechanics v20 pt4 p625-43 1964 (Copies available only to DDC users).

Descriptors: (*Conical bodies, Vortices), (*Vortices, Conical bodies), Supersonic flow, Incompressible flow, Partial differential equations, Angle of attack, Boundary layer, Series.

The problem of flow over a circular cone inclined slightly to a uniform stream is solved using the technique of matched asymptotic expansions. The outer expansion is equivalent to Stone's solution of the problem. The inner expansion, valid in a thin layer near the body, represents Ferr's vortical layer. The solution to first order in angle of attack so obtained is uniformly valid everywhere in the flow field. In the second-order expansion an additional non-uniformity appears near the leeward ray. This defect is removed by inspection. Formulas are given that may be used to render Kopal's numerical result uniformly valid to second order in angle of attack. (Author)

AD-616 236 Div. 9/6
CFSTI Prices: HC$4.00 MF$1.00

Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART,
by J. E. Wuerer and F. I. Clayton. Apr 65, 125p
Rept. no. SM-46429

Unclassified report

Descriptors: (*Supersonic flow, Separation), (*Boundary layer, Aerodynamic characteristics), Heat transfer, Aerodynamic heating, Stability, Friction, Three-dimensional flow, Reviews, Turbulent boundary layer, Mathematical analysis.

A physical explanation is given of the two types of flow separation classified as boundary layer separation and breakaway separation. A short discussion of the fluid dynamic complexity of the problem is presented. Such characteristics of separated flows as the pertinent descriptive parameters, state of flow, length of separated region, compression process, flow steadiness, and three-dimensional effects are discussed. The effects of flow separation on the pressure, skin friction and heat transfer distribution are described, and a review of semi-empirical methods for calculating the critical overall pressure rise, the geometry of the separated region, and the heat transfer at reattachment is presented. (Author)

AD-616 249 Div. 1/4, 33/1

Army Engineer Waterways Experiment Station, Vicksburg, Miss.
ANCHOR SYSTEMS FOR PREFABRICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964,
by Sidney G. Tucker. May 65, 76p
Technical rept. no. TR-3-675, R-1

Unclassified report

Available from Waterways Experiment Station, Vicksburg, Miss. $0.75.

Descriptors: (*Membranes, Effectiveness), (*Landing mats, Anchors(Structural)), (*Anchors-(Structural), Landing mats), Helicopters, Nylon, Synthetic rubber, Soils, Stability, Feasibility studies, Dust, Coatings, Heat, Flames, Fuel, Surfaces.

Tests were conducted to evaluate the performance of a neoprene-coated nylon membrane placed as a dust-proofing surfacing on a soil area and held in place by improvised anchor systems, and to determine the suitability of the membrane anchored in this fashion for operations of the CH-21C helicopter. In the laboratory, the membrane was tested to determine its weight, tensile and tear strengths, elongation, permeability, and resistance to weathering, flame, heat, cold, and fuel spillage. In the field, the prefabricated, 156-ft-square surfacing was placed over natural and constructed subgrades and secured in place by flat-plate and arrow-head anchor systems. The surfacing, anchored with interior rings and a perimeter row of flat-plate anchors, was subjected to operations of the CH-21C helicopter to simulate aircraft traffic normally occurring on a hastily prepared, pioneer-type helicopter landing pad. (Author)

AD-616 267 Div. 1/2
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVIATION OF LIFT FAN NOISE.
Final rept. for Jul 63-Aug 64,
by Harry D. Sowers. Apr 65, 68p
Contract DA44 177AMC72T,
Task 1D121401A142
TRECOM TR-65-4

Unclassified report

Descriptors: (*Compressor noise, Reduction), (*Jet engine noise, Reduction), (*Fans, Noise), Mathematical prediction, Control, Design, Tests, Perturbation theory, Configuration.

A research investigation into the generation, suppression and prediction of fan noise was completed. The theoretical investigations provided insight into the basic noise generating mechanism of fan noise commonly called fan or compressor 'whine'. Acoustic normalizing techniques resulted in a correlation curve of the overall sound power for 13 separate fan and compressor vehicles with each one being from a different design family. Investigation of noise minimization through design techniques incorporated the results of the analytical investigations and the normalized sound power relations. Results indicate the effect or rotor-stator spacing, blade number, RPM, inlet length and centerbody design. Suppression techniques evaluated were wave cancellation, deflection, and absorptive suppressor designs. Test results of an absorptive type suppressor show up to 10.5 db maximum suppression as tested with a sale model fan configuration.

AD-616 285 Div. 9/6
CFSTI Prices: HC$2.00 MF$0.50

Gas Dynamics Lab., Princeton Univ., N. J.
THEORIES OF THERMAL TRANSPIRATION AND MOLECULAR EFFUSION,
by Yau Wu. Feb 65, 29p Rept. no. 718
Contract AF49 638 1271; Grant NSF GK59
AFOSR 65-0645
Unclassified report

Descriptors: (*Gas flow, Theory), (*Superaerodynamics, Theory), (*Thermodynamics, Gas flow), Molecular properties, Reynolds number, Integral equations, Partial differential equations, Motion.

Revised theories of thermal transpiration and molecular effusion are presented in a rigorous treatment. It is a modified version of the classical laws of Reynolds and Graham. A set of invariants and a new geometrical property (Isotropicity) are found in a system with non-uniform temperature distribution on the boundary in the Knudsen regime. The reciprocal transmission probability theorem is proved to be valid in this stationary state system according to the invariant of number flux throughout the region. (Author)

AD-616 321 Div. 9/6
CFSTI Prices: HC$3.00 MF$0.75

Aeroelastic and Structures Research Lab., Mass. Inst. of Tech., Cambridge.
THE FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL,
Scientific rept.,
by Earl H. Dowell. Jan 65, 75p ASRL-TR-112-3
Grant AF AFOSR62 363
AFOSR 65-0639
Unclassified report

Descriptors: (*Flutter, Cylindrical bodies), (*Structural shells, Flutter), (*Slender bodies, Flutter), Aerodynamic loading, Incompressible flow, Stability, Equations, Numerical analysis, Elasticity.

The aeroelastic stability of an infinitely long, isotropic cylinder with the outer surface exposed to an inviscid flow is re-examined. The cylinder behavior is described by the shell equations of Goldenvieser, while the aerodynamic forces are described by the classical linearized potential theory. An important consequence of the present study is the indication that the aerodynamic loading on the cylinder is of the 'slender body' type when the axial wavelength is large compared to the circumferential wavelength. (Author)

AD-616 357 Div. 9/6
CFSTI Prices: HC$5.00 MF$1.00

Payne (Peter R.) Inc., Rockville, Md.
CURVED JET FLOWS, VOLUME II.
Final rept. for Jul 64-Jan 65,
by Peter R. Payne and Alastair Anthony. May 65, 160p
Contract DA44 177AMC238T,
Task 1D121401A14203 Unclassified report
USAAML TR-65-20
See also AD-616 395.

Descriptors: (*Jets, Mathematical analysis), Coanda effect, Geometric forms, Ducts, Jet mixing flow, Compressible flow, Nozzles, Boundary layer, Perturbation theory.

The shape integral is calculated for a number of idealized asymmetric distributions.

AD-616 395 Div. 9/6
CFSTI Prices: HC$5.00 MF$1.00

Payne (Peter R.) Inc., Rockville, Md.
CURVED JET FLOWS. VOLUME I.
May 65, 153p
Contract DA44 177AMC238T,
Task 1D121401A14203 Unclassified report
USAAML TR-65-20
See also AD-616 357.

Descriptors: (*Jets, Mathematical analysis), Annular nozzles, Vortices, Integral equations, Geometric forms, Ducts, Theory, Coanda effect, Jet flaps, Diffusion, Subsonic flow, Subsonic characteristics, Momentum.

A simple equation is derived to describe curvilinear flow, and this is then applied to various practical problems. In the case of annular jet flow, previous theories are shown to be approximate solutions to the general equation; the more exact solution of the report is shown to give better agreement with experiment. The new theory is also applied to the flow of air in a curved duct, the flow into an intake, the jet flap, and Coanda flow. Comparison with experiment again gives good agreement. Because curvilinear flow implies diffusion, the theory of diffusion is studied in some detail, and a general theory is developed for the total head lost in a rapid diffusion. When applied to the diffusion loss measured in the nozzle of an annular jet, and the analogous losses in a curved duct, the theory gives excellent agreement with experiment. The various investigations cover fairly wide areas in subsonic aerodynamics. Thus, it has proved impossible to work out the applications of the theory completely for all the cases considered. The same is true of the experimental work reported. (Author)

AD-616 400 Div. 9/7
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES,
by J. D. Sartor and R. R. Rapp. 30 Oct 59, 15p
Rept. no. P-1830
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. To be submitted to Tellus.

Descriptors: (*Particles, Drag), (*Drag, Particles), (*Spheres, Drag), Geometric forms, Tests, Tables, Numerical analysis, Reynolds number, Density, Radioactive fallout.

This report presents the results of several laboratory tests conducted with spherical and irregularly shaped particles. These measurements were made to clarify the law of fall of irregular particles in the range of Reynolds numbers from 0.035 to 3.5. The results of the experiments are presented in tabular form, and are compared graphically with the theoretical approximation to the rate of fall of spheres and with the accepted curve for spheres. (Author)

02. Agriculture

No entries

03. Astronomy and Astrophysics

AD-616 191 Div. 2/1

California Inst. of Tech., Pasadena.
PROPERTIES OF MASSIVE OBJECTS,
by F. Hoyle and William A. Fowler. 1964, 11p
Contract Nonr22047; Grant NASA NGR05 002 028
Unclassified report

Pub. in mono. Quasi-Stellar Sources and Gravitational Collapse. (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Stars, Gravity), (*Gravity, Stars), (*Extraterrestrial radio waves, Sources), Radio astronomy, Density, Temperature, Nuclear reactions, Deformation.

The bigger they come, the harder they fall.

AD-616 195 Div. 2/1

Florida Univ., Gainsville.
RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON,
by Heins Bollhagen, Jorge May, Jorge Levy, Thomas D. Carr, and Alex G. Smith. 1965, 7p
Unclassified report

Research supported by National Science Foundation and Office of Naval Research, Washington, D. C., and Army Research Office, Durham, N. C. Pub. in Quarterly Journal of the Florida Academy of Sciences v28 n1 p1-6 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Astronomical data, Radio interference), Radio astronomy, Ionosphere, Earth, Low frequency, Noise(Radio), Jupiter, Chile.

The portion of the electromagnetic spectrum which is accessible to earth-bound radio astronomers is limited at its low-frequency end by the effects of the terrestrial ionosphere. The sources which have been studied most extensively at the lower frequencies by radio astronomers are the galactic source, the sun, and Jupiter. A substantial fraction of the data which are currently available on the low frequency noise bursts from Jupiter were obtained at the Maipu Radioastronomical Observatory, near Santiago, Chile. This observatory is operated jointly by the University of Florida and the University of Chile. The Maipu observatory is located on a plain surrounded by hills, which are too low to offer protection from terrestrial interference. However, innumerable valleys and canyons abound in the nearby Andean foothills. It was therefore decided to install a radio telescope on the floor of a suitable canyon, and to compare the terrestrial interference reaching this radio telescope with that experienced at the same time by an identical instrument on the exposed plain at Maipu. With the aid of Dr. Jurgen Stock, director of the astronomical observatory being constructed at Cerro Tololo in the Chilean Andes under the auspices of Associated Universities for Research in Astronomy, a suitable canyon for the experiment was found near Cerro La Peineta, about 650 kilometers north of Maipu. The Simultaneous observations at Peineta Canyon and at Maipu were performed during December, 1962. (Extracted)

AD-616 227 Div. 2/1, 25/7

California Univ., Santa Barbara.
A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERSTELLAR GRAINS,
by E. E. Ferguson and H. P. Broida. 26 Aug 64, 3p
Technical rept. no. TR-8
Contract Nonr422201, ARPA Order 125
Unclassified report

Pub. in Astrophysical Journal v141 n2 p807-9 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Light, Absorption), (*Interstellar matter, Absorption spectrum), Complex compounds, Ionization potentials, Photochemistry, Ultraviolet radiation, Spectra-(Visible + Ultraviolet).

A wide variety of postulates have been put forward concerning the chemical composition and formation mechanisms of interstellar grains, their physical properties, and their connection with the diffuse absorption bands and the interstellar reddening. Part of the absorption may be due to the so-called 'charge-transfer absorption,' ordinarily observed with large molecules such as aromatic hydrocarbons. The charge-transfer (C-T) absorption bands due to molecules usually are quite broad, approx. 500 A being a typical half-width. The typical values of ionization potentials of approx. 10 eV and Coulomb energies approx. 4 eV will cause the C-T absorption band maxima to lie in the UV. It is important to point out that vertical ionization potentials are involved, and these may be greater than equilibrium values by significant amounts. In general the expected absorption band lies in the violet or ultraviolet with a tail possibly extending into the visible blue. It is speculated that such blue absorption may contribute to interstellar reddening. The ultraviolet C-T absorption could, of course, be significant even if it does not extend into the visible sufficiently to contribute to the interstellar reddening. There is no obvious reason why atom plus molecule pairs should not show C-T absorption, just as do molecular pairs. While no conclusive evidence concerning light absorption by interstellar grains is presented, a new speculative process is thus introduced which may account for some part of the interstellar reddening. (Extracted)

AD-616 244 Div. 2/1
CFSTI Prices: HC$1.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
THE EQUATORIAL AIRGLOW,
Air force surveys in geophysics,
by S. M. Silverman. Apr 65, 25p
Rept. no. AFSG-162, AFCRL 65-280
Proj. 7661, Task 766101 Unclassified report

Descriptors: (*Sky brightness, Measurement), Diurnal variations, Night sky.

Published data on the equatorial airglow are critically reviewed. A number of new results, based primarily on data collected during the IGY, are presented for the oxygen green line and the sodium line. It is shown that the diurnal variation of the green line in equatorial regions is markedly different from that in temperate latitudes. (Author)

AD-616 250 Div. 2/1
CFSTI Prices: HC$6.00 MF$1.50

Institut d'Astrophysique, Cointe-Sclessin (Belgium).
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: REDUCTION OF THE AROSA OBSERVATIONS.
Rept. for 1 Jan-31 Dec 57,
by E. Vigroux and A. Debaix. 31 May 63, 257p
Technical note no. TN-1A
Contract AF61 514 962
AFCRL 64-88-A Unclassified report

Rept. prepared in cooperation with Institut d'Astrophysique, Paris (France).
See also AD-616 251, AD-616 252.

Descriptors: (*Ozone, Atmosphere), Switzerland, Astrophysics, Geophysics, Distribution, Absorption spectrum, Water vapor, Emissivity, Tables, Belgium, France.

Vertical 03 distributions above Arosa, Switzerland, are given for each observing day between 8 November 1956 to 31 December 1957.

AD-616 251 Div. 2/1
CFSTI Prices: HC$6.00 MF$1.25

Liege Univ. (Belgium).
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE. REDUCTION OF THE AROSA OBSERVATIONS.
Technical note no. 1B, 1 Jan-29 Oct 58,
by E. Vigroux and A. Debaix. 31 May 63, 238p
Contract AF61 514 962
AFCRL 64-88 B Unclassified report

See also AD-616 250, AD-616 252.

Descriptors: (*Ozone, Atmosphere), Switzerland, Astrophysics, Geophysics, Distribution, Absorption spectrum, Water vapor, Emissivity, Tables, Belgium, France.

Vertical 03 distributions above Arosa, Switzerland, are given for each observing day between 1 January and 29 October, 1958.

AD-616 252 Div. 2/1
CFSTI Prices: HC$5.00 MF$1.00

Institut d'Astrophysique, Cointe-Sclessin (Belgium).
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958,
by E. Vigroux and A. Debaix. 31 May 65, 155p
Technical Note no. TN-1C
Contract AF61 514 962
AFCRL 64-88-C
Unclassified report

Rept. prepared in cooperation with Institut d'Astrophysique, Paris (France).
See also AD-616 250, AD-616 251.

Descriptors: (*Ozone, Atmosphere), Switzerland, Astrophysics, Geophysics, Distribution, Absorption spectrum, Water vapor, Emissivity, Graphics, Belgium, France.

Abstract:
Graphical representations of vertical 03 distributions, as given in tables of Technical Notes 1A and 1B, are presented.

04. Atmospheric Sciences

AD-615 768 Div. 2/3, 2/5
CFSTI Prices: HC$1.00 MF$0.50

Directorate of Scientific Information Services, Ottawa (Ontario).
IS THE BRIKNER (BRUECKNER) CYCLE REAL,
by S. I. Kostin. May 65, 4p Rept. no. T-425-R
TT 65-62375
Unclassified report

Trans. of Priroda (USSR) v54 n2 p78-9 1965.
Also available from NRC.

Descriptors: (*Climatology, Periodic variations), (*Sedimentary rock, Climatology), Humidity, Silt, USSR.

At the beginning of the 1880's E. A. Brikner established that climatic conditions, over almost the whole land surface of the globe, underwent cyclic fluctuations. In each cycle, of duration about 35 years, a period of humid and cold years is followed by one of dry, high-temperature years. The climatic fluctuations discovered by Brikner do not always show up distinctly. In some periods they have been well marked, in other periods weakly marked or quite absent. Hence doubts have arisen about the existence of the Brikner cycle. (Author)

AD-615 772 Div. 2/7, 6/6
CFSTI Prices: HC$3.00 MF$0.75

Illinois State Water Survey, Urbana.
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
Final rept. for 1 Oct 61-30 Sep 64,
by A. L. Sims, F. A. Mueller, and G. E. Stout.
30 Sep 64, 59p
Contract DA36 039SC87280, Projs. 3A99 07 001 01, 1V0 14501B53A07
Unclassified report

Descriptors: (*Atmospheric precipitation, Meteorological radar), (*Meteorological radar, Atmospheric precipitation), Raindrops, Distribution, Rainfall, Radar echo areas, Radioactive fallout, Cameras, Trafficability, Communication systems.

The object of the research is to study the utility of radar equipment in measuring surface precipitation, and to improve radar techniques in measuring precipitation for application by the Army to radioactive rainout prediction, trafficability, and communications. Considerable effort is being directed toward determining the correlation between radar variables and actual rainfall quantities by means of raindrop-size distribution.

AD-615 923 Div. 2/7
CFSTI Prices: HC$3.00 MF$0.75

DECO, Electronics, Inc., Boulder, Colo.
10 KC/S ATMOSPHERIC NOISE PREDICTIONS,
by E. L. Maxwell and D. L. Stone. May 65, 57p
Rept. no. 54-F-2
Contract Nonr410700, Proj. NR371 630
Unclassified report

Descriptors: (*Atmospherics, Very low frequency), (*Atmosphere, Noise), Propagation, Thunderstorms, Meteorological parameters, Maps, Computers.

This report contains a full set of atmospheric noise prediction maps for 10 kc/s. The procedure involved in transferring the 1 megacycle maps given for local time and seasonal periods in CCIR Report 322 to 10 kc/s maps given in Universal Time for three month periods is described in this report. A new approach to the prediction of VLF atmospheric noise was begun under this program and preliminary results are presented herein. The presentation of the CCIR data on a universal worldwide scale for a particular three month period revealed serious shortcomings and obvious disagreements with noise source and VLF propagation characteristics. The new technique begun makes direct use of noise source and propagation information. The preliminary results indicate that this technique may offer considerable advantages in the VLF range. (Author)

AD-615 924 Div. 2/7, 12/1, 30/2
CFSTI Prices: HC$4.00 MF$1.00

IBM Corp., Cambridge, Mass.
ATMOSPHERIC DENSITY DETERMINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
Final rept.,
by A. S. Bramson and V. L. Foxworthy. Dec 64, 133p
Contract AF19 628 4043, Proj. 6690, Task 669005
AFCRL 65-25 Unclassified report

See also AD-606 698.

Descriptors: (*Upper atmosphere, Density), (*Meteorological satellites, Monitors), Satellites(Artificial), Orbital trajectories, Atmosphere models, Programming(Computers), Data processing systems, Mathematical analysis, Programming languages.

Atmospheric densities may be computed from satellite observations by the following procedures: (1) Obtain accurate orbital elements from a differential orbit correction procedures; (2) Fit each element as a function of time; (3) Analyze the residuals in mean anomaly; (4) Compute the rate of change of the anomalistic period; (5) Derive density data by integrating Sterne's formula in which Jacchia's model atmosphere is used. This report describes a computer program which has been written to carry out these procedures. It is believed that this program represents the first attempt at an automatic computation of atmospheric density at perigee heights in particular, and may also represent an advance in the state-of-the-art of automatic data processing in general. (Author)

AD-615 949 Div. 2/1, 2/7, 12/1
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT,
by R. C. Moore and G. F. Schilling. May 65, 47p
Rept. no. RM-4557-PR
Contract AF49 638 700 Unclassified report

Descriptors: (*Satellites(Artificial), Astronomical data), (*Lunar eclipses, Spacecraft), (*Solar eclipses, Spacecraft), Manned spacecraft, Sun, Moon, Earth, Upper atmosphere, Tables.

The expected appearance of the earth and sun from within the earth's shadow-cone is derived for various distances from the earth's surface. Results suggest that unique information about the earth's upper atmosphere can be obtained from manned and unmanned spacecraft by utilizing well known eclipse techniques. It is shown that existing physical conditions permit the conduct of relevant experiments with simple instrumentation from most space missions within cislunar space. (Author)

AD-615 956 Div. 2/7
CFSTI Prices: HC$1.00 MF$0.50

Emmanuel Coll., Boston, Mass. Research Language Center.
ACTA METEOROLOGICA SINICA, VOL. 34, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS,
ed. by Richard M. Holden. Jun 64, 14p
E-TC-Ch-64-25
Contract AF19 628 3869
TT 65-62405
Unclassified report

Abstract trans. of Ch'i Hsiang Hsueh Pao (Chinese People's Republic) v34 n1 p1-126 1964.

Descriptors: (*Meteorology, Abstracts), China, Wind, Geophysics, Air mass analysis, Atmospheric motion, Mountains, Barometric pressure, Analysis, Southeast Asia, Pacific Ocean, Ice, Crystals, Evaporation, Convection, Electric fields, Drops, Clouds, Cumulus clouds, Raindrops, Wheat.

Contents: Some aspects of the dynamics of disturbances in a wave-shaped basic westerly current; The influence of a mountain range on the instability of disturbances; The interaction between basic current and disturbances in a baroclinic atmosphere: Power-spectrum analysis of mean monthly 500-mb charts at 60 and 30 degrees N; A synoptic analysis of the evolution of the general circulation in the upper troposphere over the northern hemisphere during early summer, 1958; A comparison of the mean wind field and mean meridional circulation between the southwestern monsoon area in Southeast Asia and the Pacific trade wind area in July 1958; Determination of the components of the radiation balance in an undulating region; An analysis of the heat balance in East China for the period 23-26 July 1959; Ice crystal formation mechanism and dry ice evaporation; The effects of vertical wind shear on the development and structure of convection; Theoretical analysis of a critical electric field to spatter charged droplets; Investigation of the micrometeorological effect of winter smoothing of wheat fields along the Yangtze river area in Nanking; The asymmetrical effect of the distribution of precipitation in clouds on the movement of individual cumulus.

AD-615 969 Div. 2/7, 8/6
CFSTI Prices: HC$2.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
THE EVOLUTION OF AN IONOSPHERIC HOLE.
Environmental research papers,
by Malcolm A. MacLeod and Dan Golomb. Apr 65,
31p Paper no. ERP-101, AFCRL 65-287
Proj. 7635, Task 763506
Unclassified report

Descriptors: (*Ionospheric disturbances, Chemicals), (*Ionosphere, Electron density), (*Electron density, Ionosphere), Terrestrial magnetism, Radiofrequency, Life expectancy, Theory, Mathematical models, Electrons, Atmosphere models, Sulfur compounds, Fluorides, Diffusion, Ionospheric propagation, Atmospheric motion, Turbulence.

The release of 10 to the 26th power molecules of sulfur hexafluoride at 220-km altitude generated an ionospheric hole which lasted about 30 minutes. Rate equations are set up and solved to explore the time and space variation of electron densities within the region. It is shown that due to the geomagnetic-field-constrained diffusion of electrons, the estimated lifetime of the hole is much longer than if unhindered radial diffusion could take place, and that the estimated lifetime is commensurate with the observed lifetime. A more quantitative comparison between the theoretical model and the observational data is possible only if the rate constants and the radio frequency sounder characteristics are specified more closely than is currently possible. (Author)

AD-615 970 Div. 2/7, 25/3, 25/8
CFSTI Prices: HC$5.00 MF$1.00

Ionosphere Research Lab., Pennsylvania State Univ., University Park.
INTRODUCTION TO THE STUDY OF AERONOMIC COLLISIONS,
by Peter Banks. 1 Feb 65, 170p
Scientific rept. no. SR-233
Contract AF19 628 4014; Grant NSF GP2914,
Projs. 8605, 5710, Task 860502
AFCRL 65-191
Unclassified report

Descriptors: (*Ionosphere, Transport properties), (*Transport properties, Gases), (*Kinetic theory, Ionosphere), Thermal conductivity, Viscosity, Diffusion, Electron density, Atmosphere electricity, Resonance, Plasma physics, Ions, Electrons.

A general survey is made of aeronomic collision processes. Particular attention is given to the derivation of energy transfer equations in terms of a suitable collision frequency for energy transfer. It is found that for collisions of electrons with neutral gas particles the most important parameter is the cross section for momentum transfer. Values of this quantity have been obtained for the atmospheric gases and are plotted as a function of electron temperature. An investigation of charge transfer processes has also been made and the cross sections for resonant, accidentally resonant, and non-resonant charge exchange reactions calculated. Throughout all derivations the attempt has been made to indicate the detailed effects of non thermal equilibrium between electrons, ions, and the neutral gases. (Author)

AD-615 972 Div. 2/7, 8/6
CFSTI Prices: HC$3.00 MF$0.75

Boston Univ., Mass.
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION,
by Alan H. Katz. Mar 65, 68p
Scientific rept. no. SR-2
Contract AF19 628 2350, Proj. 5629
AFCRL 65-118
Unclassified report

Descriptors: (*Atmosphere, Electromagnetic waves), (*Electromagnetic waves, Extremely low frequency), Diurnal variations, Thunderstorms, Solar eclipses, Solar radiation, Ionosphere, Ionospheric disturbances, Ionospheric propagation, Terrestrial magnetism.

Multifrequency observations of naturally occurring EM Radiation at ELF were made at Sagamore Hill Radio Observatory, Hamilton, Mass. during the past three years. Some results of these measurements were compared with similar ones made at Kiruna, Sweden. From July 1963 to Aug. 1964 continuous recordings of 8 cps EM radiation were made at Sagamore Hill. A distinct diurnal variation of high nighttime to low daytime level was observed for this period. It is shown that the observed diurnal variation can be correlated with thunderstorm activity. Observations made during the eclipse of July 20, 1963 showed that a return to high nighttime level occurred during the eclipse. Measurements of EM radiation for frequency range 10 cps to 10 kc/s are compared for Sagamore Hill and Kiruna, which is located in the Auroral zone. Measurements of N-S and E-W components of 5 kc/s radiation for November, December, and January of 1963-1964 were also made at Sagamore Hill. From Jan. 1962 to March 1963 continuous recordings of 18 kc/s from a transmitter located at lat. 8 degrees 57 minutes N and long. 70 degrees 34 minutes W were made at Sagamore Hill. (Author)

AD-616 008 Div. 2/7, 4/4, 30/5

New Mexico Univ., Albuquerque. Dept. of Physics and Astronomy.
(1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS,
by Victor H. Regener and John G. Breiland. 1 May 65, 20p Scientific rept. no. SR-1
Contract AF19 628 2927, Projs. 8604, 8631, Tasks 860406, 863102
AFCRL 65-153 Unclassified report

Pub. in Journal of Geophysical Research v69 p3795-3800/3801-8 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Atmospheric sounding, Ozone), (*Ozone, Measurement), Chemical reactions, Luminescence, Atmospheric sounding, Meteorology, Reports, Atmosphere.

AD-616 067 Div. 2/7, 9/1

Pennsylvania State Univ., University Park. Dept. of Aeronautical Engineering.
WEAK SHOCK WAVES IN THE IONOSPHERE,
by D. P. Hoult. 1963, 4p
Contract DA ARO31 124 6537; Grant NsG134 61
AROF 4515:1 Unclassified report

Pub. in Journal of Geophysical Research v69 n21 p4617-20 Nov 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ionosphere, Shock waves), (*Shock waves, Ionosphere), Chemical reactions, Chemical equilibrium, Sounding rockets, Ionization.

It is shown that in the D region of the ionosphere the shock formed by the nose of a sounding rocket introduces serious errors in measurement of the ionic composition of the region. A simple model of the chemistry of the ionosphere is developed, which correctly predicts the equilibrium composition of the D region as estimated by Nicolet and Aikin. Using this model, we calculate the chemical structure of a weak shock in the ionosphere. The result is compared with an equilibrium calculation. The effects of impurities are discussed. (Author)

AD-616 094 Div. 2/7
CFSTI Prices: HC$4.00 MF$1.00

McGill Univ., Montreal (Quebec). Stormy Weather Group.
TWO STUDIES OF CONVECTION. A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION. HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS,
by R. C. Srivastava and C. D. Henry. Oct 64, 139p
Scientific rept. no. MW-38
Contract AF19 628 249, Proj. 8620, Task 862004
AFCRL 65-10 Unclassified report

Descriptors: (*Convection, Cumulus clouds), (*Thunderstorms, Radar echo areas), Meteorological phenomena, Canada, Atmospheric precipitation, Meteorological radar.

AD-616 103 Div. 2/7, 25/7
CFSTI Prices: HC$5.00 MF$1.25

Geophysics Corp. of America, Bedford, Mass.
THEORETICAL STUDIES OF HEAVY ION EXCHANGE IN AIR.
Final rept. for 17 Jun 63-30 Jun 64,
by G. A. Victor and T. G. Webb. Apr 65, 191p
Rept. no. 64-9-A
Contract AF29 601 6108, Proj. 5710, Task 07 003
WL TR-64-110
Unclassified report

Descriptors: (*Ion exchange, Air), (*Air, Ion exchange), Exchange reactions, Theory, Atmosphere, Gases, Argon, Nitrogen, Oxygen, Atoms, Nuclear cross sections, Aluminum, Metals, Ions.

The results are presented of a search for charge exchange reactions possessing small energy defects (for which the Massey adiabatic theory predicts a large cross section) between typical metallic ions and neutral atomic and molecular atmospheric constituents. The Brinkman-Kramers (BK) approximation has been applied to calculate the differential and total cross sections (for velocities between 0.1 and 75 au) of the reaction Al(+)(3s(2) (1)S) plus A(3p(b) (1)S) yields Al(3p (2)F) plus A(+)(3p (5) (2)p). These are compared with available experimental data. In appendix I it is estimated that the cross sections for radiative charge exchange processes are negligible by comparison with those for the radiationless processes except at the lowest velocities of interest. Appendix II contains the results of this survey and a discussion of the validity of semi-empirical curve fitting and scaling of the data. A brief review of the available theoretical descriptions of inelastic heavy particle rearrangement collision processes is presented in appendix III. The detailed formulation for the above reaction is presented in appendix IV; the formulations for several other reactions have been completed and are also indicated. (Author)

AD-616 107 Div. 2/7, 30/5
CFSTI Prices: HC$3.00 MF$0.75

Lowell Technological Inst. Research Foundation, Mass.
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
Final rept. for 1 Sep 62-31 Dec 64,
by Klaus Bibl, Charles P. Pike, Jr., Jackie B. Waaramaa, and Rosemarie A. Wagner. Feb 65, 57p
Contract AF19 628 1682, Projs. 8653, 4603, Tasks 865313, 460313
AFCRL-65-189
Unclassified report

Descriptors: (*Ionosphere, Scientific research), (*Atmospheric sounding, Instrumentation), (*Aircraft, Atmospheric sounding), Solar eclipses, Aurorae, Very low frequency, Loran.

Possibilities and limitations in ionospheric research with an aircraft as carrier are described; the experiments comprise LF and HF pulse sounding, VLF reception, and magnetometer recordings. The mobility of the Flying Laboratory permits observation of the rare and strong events in the ionosphere which are caused by solar eclipses and eruptions as well as topographic anomalies, auroras and artificial nuclear tests. The observations of these phenomena and special measurements of ionospheric drift, of deviative and nondeviative absorption, and of reflection height made the development of special recording and playback methods necessary. Ray paths of the different possible modes arriving at an airplane are derived. (Author)

AD-616 124 Div. 2/7, 2/3
CFSTI Prices: HC$4.00 MF$1.00

Air Force Cambridge Research Labs., Bedford, Mass.
STRATOSPHERIC ENERGY PROCESSES AND ASSOCIATED ATMOSPHERIC LONG-WAVE STRUCTURE IN WINTER.

Environmental research papers,
by H. Stuart Muench. Apr 65, 134p
Paper no. ERP-95, AFCRL 65-236
Proj. 8628, Task 862807 Unclassified report

Descriptors: (*Stratosphere, Energy), (*Atmosphere models, Climatology), Atmospheric motion, Dynamics, Harmonic analysis.

The question of the source of energy for the changes in the mid-winter stratosphere circulation pattern associated with the sudden warming phenomenon is examined. A set of energy equations is derived which is applicable to the stratosphere as an open system. The terms of these equations are interpreted as representing energy conversions and energy fluxes. The terms are evaluated for January 1958, for the mass from 100 mb to 10 mb and from 10N to 90N. Within the mass studied, the energy conversions acted in the same direction throughout the month, but increased in magnitude prior to and during the stratosphere warming. Energy was lost due to differential diabatic heating but was gained, at the expense of tropospheric energy, through a correlation between vertical velocity and geopotential. The apparent coupling with the troposphere is investigated further through harmonic analysis and evidence is found for vertically propagating long waves. A simple model is deduced from the data to explain certain phenomena in the stratosphere. (Author)

AD-616 140 Div. 2/7, 2/1

Air Force Cambridge Research Labs., Bedford, Mass.
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
Environmental research papers,
by J. A. Klobuchar and H. E. Whitney. 6 Oct 64, 14p
Paper no. ERP-102, AFCRL-65-317
Proj. 4643, Task 464301 Unclassified report

Pub. in Journal of Geophysical Research v70 n5 p1254-7 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electron density, Ionosphere), (*Ionosphere, Electron density), (*Solar eclipses, Ionospheric disturbances), Magneto-optic effect, Extraterrestrial radio waves.

Lunar-reflected radio waves were used to determine changes in the total columnar electron content of the ionosphere during the July 20, 1963 total solar eclipse. A decrease of approximately 4x10 to the 16th power electrons in an equivalent vertical column of ionosphere was noted by observing the decrease in Faraday polarization twist. A time delay of 48 minutes between maximum optical phase and the minimum electron content was also observed. Vertical ionosonde and incoherent scatter radar data taken by J. V. Evans at Lincoln Laboratory showed a decrease of only 2 to 2.5 x 10 to the 16th power electrons in a one square meter vertical column up to 800 km in height. The amount of Faraday polarization rotation above 800 km should be small since the electron density and magnetic field intensity decrease with increasing height; thus, the apparent discrepancy between the Faraday data and the incoherent scatter radar data cannot be fully explained by changes in electron density above 800 km. It is likely that the comparison between vertical incidence incoherent scatter measurements and moderate zenith angle Faraday effect measurements may not be valid under disturbed ionospheric conditions. (Author)

AD-616 172 Div. 2/7

Iowa State Univ., Iowa City.
A SURVEY OF ELECTRONS E > 40 KEV BEYOND 5 EARTH RADII WITH EXPLORER 14,
by L. A. Frank. 11 Jan 65, 35p
Contract N9onr93803; Grant NsG233 62
Unclassified report

Pub. in Journal of Geophysical Research v70 n7 p1593-1626 Apr 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrons, Intensity), (*Energy, Ionospheric propagation), (*Ionospheric propagation, Energy), Terrestrial magnetism, Distribution, Atmospheric electricity.

AD-616 179 Div. 2/7

Lockheed Missiles and Space Co., Palo Alto, Calif. Research Labs.
VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES,
by W. L. Imhof and R. V. Smith. 1964, 6p
Contracts DA49 146XZ205, NAS5 3111
Unclassified report

Domestic reprint(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrons, Intensity), (*Ionospheric propagation, Energy), Low-orbit trajectories, Scattering, Atmospheric electricity.

Electron fluxes and energy spectra have been measured on low-altitude polar orbiting satellites in late 1962 and in 1963. The data have been analyzed in terms of the changes of electron intensity and energy spectrum with the coordinates B, L and longitude. The 1962 measurements were performed with shielded plastic scintillators having effective electron thresholds of 1.2 and 2.4 MeV. The 1963 measurements were performed with a plastic scintillation spectrometer equipped with a 16-channel pulse height analyzer operating in two energy ranges (0.3 to 2.6 MeV, and 0.3 to 10.0 MeV) and coded in binary form for the digitized telemetry of individual counts. On low L shells (L < or = 1.7) the electron fluxes observed at large B values are found to undergo a buildup with eastward drift until the electrons are dumped in the Brazilian anomaly. Energy spectra of these electrons are much softer than those of the trapped electrons mirroring at lower B values on the same L shell, and are consistent with their source being the preferential low energy scattering of the harder trapped electrons. This interpretation is further substantiated by the similarity of decay in intensity of the electrons at high B values and decay of the general electron population on the same L shell. (Author)

AD-616 253 Div. 2/7
CFSTI Prices: HC$2.00 MF$0.50

McGill Univ., Montreal (Quebec).
SOME ASPECTS OF THE MIDDLE STRATOSPHERE.
Publication in Meteorology, final rept. for Mar 61-Feb 65,
by Byron W. Boville. Mar 65, 40p
Rept. no. AMRG-PM-75
Contract AF19 604 8431, Proj. 8628, Task 862807
AFCRL 65-187
Unclassified report

Descriptors: (*Stratosphere, Meteorology), (*Meteorology, Stratosphere), (*Ozone, Stratosphere), Meteorological charts, Troposphere, Northern hemisphere, Southern hemisphere, Polar regions, Atmospheric temperature, Canada.

The mean pressure patterns in the middle stratosphere and the latitudinal distribution of total ozone are pre-

sented for both hemispheres. It is then inferred that the major stratospheric warmings are probably associated with non-linear baroclinic interaction between troposphere and stratosphere. The major difficulties in resolving the problem arise from the absence of vertical motion measurements and our present inability to model effectively on the planetary scale. (Author)

AD-616 295 Div. 2/7
CFSTI Prices: HC$4.00 MF$0.75

Stanford Research Inst., Menlo Park, Calif.
DISTRIBUTIONS AND CHARACTERISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
Final rept. for 7 Nov 62-31 Jan 65,
by Roy H. Blackmer, Jr. and John E. Alder. Apr 65, 106p
Contract AF19 628 1681, Projs. 8624, 4304, Task 862401
AFCRL 65-211
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Cloud cover, Distribution), Photographic analysis, Time, Meteorological parameters, Meteorological radar, Meteorological satellites, Visibility, Probability.

Cloud cover--as shown by various types of data such as surface observations, satellite photographs, U-2 photographs, and vertically pointing radar--was analyzed to provide information on clouds as an obstacle to vision through the atmosphere. In these studies the photographic data were used to assess the extent to which significant operational knowledge can be derived from surface cloud observations. Comparison of surface observations with U-2 and TIROS photographs shows that surface observations are frequently not representative of cloud cover over even a small fraction of the distance between adjacent stations. Time changes in cloud cover were determined from hourly cloud observations and were summarized to show the probability of extended periods of various amounts of cloud cover. Comparison of probabilities for different seasons and different geographic locations is included. The probabilities of seeing specific locations along latitudes 15, 30, and 45 degrees N were determined from nephanalyses of TIROS photographs and surface synoptic reports. These probabilities are given for the four seasons, and the effects of synoptic features on these probabilities are discussed. The report also contains cloud top altitudes measured from U-2 photographs and thicknesses of cloud layers with bases at various heights as shown by a vertically pointing radar. (Author)

AD-616 318 Div. 2/7

Lockheed Missiles and Space Co., Sunnyvale, Calif.
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM,
by A. D. Anderson and W. E. Francis. Mar 65, 74p Rept. no. 6-75-65-19
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
See also AD-600 472.

Descriptors: (*Upper atmosphere, Physics), (*Atmosphere models, Upper atmosphere), Atmospheric temperature, Sunspots, Solar radiation, Time, Atmosphere, Tables, Exosphere, Density, Pressure, Oxygen, Nitrogen, Molecular weight, Atomic properties, Ultraviolet radiation, Sun, Earth, Diurnal variations.

A semi-theoretical model of the upper atmosphere has been constructed to allow the calculation of the primary neutral atmospheric properties (temperature, density, pressure, and composition) from 90 to 10,000 km as a function of local time and solar activity. The results of these calculations are presented in the form of tables for various local times and solar activities ranging over a solar cycle. The density in the exosphere is corrected for the escape of atomic hydrogen from the Earth's atmosphere. In order to check the model, the temperature, molecular weight, density and number densities for O, O2, and N2 are computed from 130 to 200 km for conditions of solar activity and local time corresponding to measurements made by Nier et al. (Neutral composition of the atmosphere in the 100- to 200-kilometer range, J. Geophys. Res., 69:979-989 (1964)) at White Sands on June 6, 1963. The observed properties and those calculated with the model differ by an average of 10 per cent. (Author)

AD-616 320 Div. 2/7
CFSTI Prices: HC$2.00 MF$0.50

Litton Systems, Inc., Minneapolis, Minn. Applied Science Div.
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
Addendum to Final rept.,
by L. W. Engberg and A. D. Belmont. 26 Apr 65, 28p
Rept. no. 2602A
Contract AF19 628 383, Proj. 8624, Task 862401
AFCRL 64-806 Add
Unclassified report

Addendum to final rept. dated 21 Aug 64, AD-610 603.

Descriptors: (*Stratosphere, Arctic regions), (*Arctic regions, Stratosphere), Atmospheric temperatures, Density, Distribution, Measurement, Statistical analysis, Meteorological parameters.

Using various extrapolation and interpolation techniques, serially complete sets of 20-km temperature data were derived for the arctic stations of St. Paul Island and Alert. Frequency distributions for the serially complete data were prepared and compared with those formed using observed temperatures only. The comparisons depicted only minor differences for St. Paul Island but significant differences for Alert. It was concluded that the cause of the bimodal form in any specific distribution is solely due to the relationship between the time of change in thermal conditions and the data period over which the distribution was formed. (Author)

AD-616 347 Div. 2/7, 30/3
CFSTI Prices: HC$3.00 MF$0.75

Litton Systems, Inc., Minneapolis, Minn. Applied Science Div.
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
Final rept.,
by Lothar H. Ruhnke. 20 Oct 64, 61p
Rept. no. ASD-2639
Contract AF19 628 3894, Proj. 6670, Task 667001
AFCRL 64-869 Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Meteorological instruments, Probes-(Electromagnetic)), (*Radiosondes, Tests), (*Clouds, Probes(Electromagnetic)), Electrostatics, Dipole antennas, Atmospheric electricity, Electrometers, Transducers, Circuits, Atmospheric motion, Electric fields, Meteorological balloons.

An electrostatic sensor for use on weather radiosonde has been designed to detect boundaries of stratified clouds. A vertical dipole antenna senses the displacement current due to the vertical velocity of the balloon and the change of the atmospheric electric field at cloud boundaries. The electronic circuitry consists of a solid-state electrometer with 10 to the 10th power-ohm input resistance acting as a voltage resistance transducer. The circuit is simple and inexpensive; it contains no batteries or components with limited shelf life. A manned hot-air balloon was employed several times to correlate visual and electrical observations. Turbulence in clear air produces electric field fluctuations, which, to a minor degree, affect the recordings. Of concern also were undulation movements of neoprene balloons with short leader lines. Flight results show good agreement with visual observations and Weather Bureau reports. (Author)

AD-616 349 Div. 2/7, 8/1
CFSTI Prices: HC$2.00 MF$0.50

Pickard and Burns Electronics, Waltham, Mass.
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
Final rept.,
by M. F. Spears, M. N. Arlin, L. Johnson, and D. Snider. 6 Aug 63, 49p P/B Pub. no. 834A
Contract AF19 604 7394, Projs. 8653, 272,
Tasks 865305, MIPR7600 6015
AFCRL 63-634
Unclassified report

Descriptors: (*Atmospheric sounding, Instrumentation), Coupled antennas, Parametric amplifiers, Electrical impedance, Antenna radiation patterns, Performance-(Engineering).

Activity in support of AFCRL research effort is reported: (1) Impedance measurements and radiation patterns were made on a ground-based Delta antenna at Homestead Air Force Base, Florida. Results were reported separately. (2) VLF and HF receiver couplers were built and installed in KC-135 research aircraft. The VLF coupler was atmospheric-noise limited when used with a 24-inch blade antenna. The HF coupler was 26 db above atmospheric-noise minimum when used with the same antenna. (3) A parametric VLF amplifier was constructed which had a gain-bandwidth product of 180 Mc and an equivalent noise resistance of 20 k. Substantially, all amplifier noise measured was attributed to the pump and detector rather than to the varactor amplifying element. (Author)

AD-616 351 Div. 2/7, 12/1
CFSTI Prices: HC$3.00 MF$0.75

ARACON Geophysics Co., Concord, Mass.
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS.
Final rept. for 16 Mar 64-15 Mar 65,
by Paul E. Sherr and Raymond Wexler. Apr 65, 63p
Rept. no. 9G5-4
Contract AF19 628 4074, Proj. 6698, Task 669803,
AFCRL 65-193 Unclassified report

Descriptors: (*Meteorological parameters, Meteorological satellites), (*Meteorological satellites, Meteorological parameters), Radiometers, Meteorological radar, Weather forecasting, Operations research.

TIROS radiation data are shown to be of significant operational value if they can be made available in real-time. Operational features include: (1) Recognition of synoptic weather patterns which may lead to better analysis over data sparse areas. Long banded patterns of fronts and hook shaped patterns associated with mid-tropospheric systems are prominent features which may readily be observed. (2) In the mesoscale, the radiation patterns indicate the existence of middle and high cloudiness which may be related to frontal lifting or vorticity and thermal advection. Finer detail such as short waves may be identified. (3) A marked increase in the cloud system size or heights indicate probable intensification of a cyclonic system. A general increase of cold areas may show a tendency toward more meridianal flow in the mid-troposphere. The integrated analysis of the pictures, Channel 2 and 3 observations provide advantages which include better interpretation and insights into the character and growth stage of cyclonic disturbances. TIROS photographs, Channels 2 and 3 measurements clearly show the mesoscale features of a thunderstorm complex over Florida such as regions of active growth, anvil blowoff and probable rain areas, as corroborated by radar observations. (Author)

AD-616 355 Div. 2/7, 30/3
CFSTI Prices: HC$4.00 MF$0.75

Laboratory of Climatology, C.W. Thornthwaite Associates, Centerton, N. J.
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART I, ANALYSIS,
Final rept.,
ed. by John R. Mather. 30 Apr 65, 113p
Contract DA28 043AMC00001E,
Task 1V014501B53A02 Unclassified report

Descriptors: (*Meteorological instruments, Reviews), Atmospheric sounding, Meteorological parameters, High altitude, Analysis.

A survey was made of recent developments in meteorological sensors and measuring techniques from the surface up to an altitude of 150,000 feet. The results are presented as an annotated bibliography of 698 items, plus an analysis of the current state of the art and of promising developments. Modes of atmospheric sounding are analyzed also. The text includes 108 references. Atmospheric parameters covered are: temperature, pressure, humidity, wind, density, radiation flux (solar and terrestrial), and ozone concentration. (Author)

AD-616 360 Div. 2/7, 25/3, 2/6
CFSTI Prices: HC$3.00 MF$0.75

Army Electronics Command, Fort Monmouth, N. J.
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES,
by Winston H. Bostick and Aristotle Papayoanou.
Mar 65, 67p ECOM-2587
Proj. 1P0 14501B11A, Task 1P0 14501B11A34
Unclassified report

Prepared in cooperation with Stevens Inst. of Technology, Hoboken, N. J.

Descriptors: (*Ionospheric disturbances, Electron density), (*Plasma medium, Vortices), (*Vortices, Ionospheric disturbances), Atmospheric motion,

Terrestrial magnetism, Ionospheric propagation, Radio waves, Magnetohydrodynamics, Ionosphere, Magnetic storms.

Ionospheric irregularities investigated are highly localized enhancements or depressions of the ambient electron density of the ionosphere. The times of occurrence of the irregularities indicate that they are the result of turbulence in the earth's ionosphere. Laboratory experiments indicate that spinning blobs of plasma, called plasma vortices, may be good analogues to the ionospheric irregularities. These vortices, resulting from turbulent conditions in the rear of the current sheet of a coaxial accelerator, or the explosion from the button gun are found to be stable plasma structures. They are deduced to be elongated along a backround magnetic field and to rotate about an axis parallel to the field lines. Their translational motion is perpendicular to these field lines and does not appear to be slowed by the magnetic field. Thus laboratory vortices born of turbulence, drifting perpendicular to a backround field, and elongated parallel to it appear capable of connection with ionospheric irregularitis.

AD-616 374 Div. 2/7

RAND Corp., Santa Monica, Calif.
THE UPPER ATMOSPHERE AS OBSERVED WITH ROCKETS AND SATELLITES.
Revised ed.,
by William W. Kellogg. 11 Jan 60, 11p
Rept. no. P-1813

Unclassified report

Prepared for the Lectures in Aerospace Medicine, School of Aviation Medicine, Brooks AFB, Tex., 11 Jan 60.
Revision of rept. dated 2 Oct 59.
Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Upper atmosphere, Physical properties), Sounding rockets, Solar radiation, Density, Wind, Barometric pressure, Atmospheric electricity, Scientific satellites.

With emphasis on recent observations with rockets and satellites, the advances in understanding of the upper atmosphere which have occurred during and since the I.G.Y. are briefly reviewed. The global coverage of these upper atmosphere observations revealed important latitudinal and seasonal changes in densities, pressures, and winds. The composition of the upper atmosphere, and its electrical properties were observed, and the influxes of energetic particles and radiations from the sun and the radiation belts were studied from above the atmosphere. (Author)

AD-616 379 Div. 2/7
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE MUTUAL ATTRACTION OF CLOUD DROPLETS IN THE ELECTROSTATIC FIELD OF THE ATMOSPHERE,
by J. Doyne Sartor. 21 Oct 59, 21p
Rept. no. P-1824

Unclassified report

To be submitted to the Journal of Meteorology.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electrostatic fields, Atmospheric precipitation), (*Atmospheric precipitation, Electrostatic fields), Raindrops, Atmospheric electricity.

AD-616 384 Div. 2/7, 2/6
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES,
by E. H. Vestine. 7 Oct 59, 7p
Rept. no. P-1816-NSF

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Polar regions, Aurorae), (*Terrestrial magnetism, Polar regions), (*Ionospheric disturbances, Polar regions), Magnetic storms.

AD-616 386 Div. 2/7, 2/4, 30/2
CFSTI Prices: HC$3.00 MF$0.75

Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
Final rept.,
by Daniel R. Schurz and Edith Persson. Jun 64, 97p
Rept. no. R64-38
Contracts AF19 604 4973, AF19 628 370,
Projs. 8620, 7673, Tasks 862002, 76731
AFCRL 64-683

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Cumulus clouds, Photogrammetry), (*Programming(Computers), Photogrammetry), (*Photogrammetry, Cumulus clouds), Clouds, Stereoscopic photography, Data processing systems, Computer logic, Digital computers.

The photogrammetric techniques and the computer programs used in reducing time-lapse stereo photos of cumulus cloud development to three dimensional position information of discrete cloud points are described. The computer programs which reconstruct the tip, tilt and swing of the cameras, convert unscaled photo coordinate and parallax measurements to scaled values, and place these values in the proper coordinate system are described. (Author)

AD-616 394 Div. 2/7
CFSTI Prices: HC$3.00 MF$0.75

Michigan State Univ., East Lansing.
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, E,TIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
Final rept.,
by Martin Fox and Herman Rubin. 7 May 65, 81p
Rept. no. RM-132-MF-6-HR-15
Contract AF19 628 355, Proj. 8624, Task 862402
AFCRL 65-243

Unclassified report

Descriptors: (*Cloud cover, Stochastic processes), (*Meteorological parameters, Massachusetts), Mathematical models.

A stochastic model is proposed for the evolution of cloud cover. In this model each of the four observable states (clear, partially cloudy, cloudy, and overcast) is assumed to be the image under some function of two

states of an eight state Markov chain. Estimates are given of transition probabilities in the observable four state process. Tables which allow assessment of the accuracy of the estimates and of the goodness of fit of the model are also provided. (Author)

AD-616 396 Div. 2/7, 30/3
CFSTI Prices: HC$5.00 MF$1.25

Laboratory of Climatology, C. W. Thornthwaite Associates, Centerton, N. J.
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART II. BIBLIOGRAPHY.
Final rept.,
ed. by John R. Mather. 30 Apr 65, 199p
Contract DA28 043AMC00001E
Task 1VO14501B53A02 Unclassified report

Descriptors: (*Bibliographies, Meteorological instruments), (*Meteorological instruments, Bibliographies), Abstracting, Atmospheric sounding, Meteorological parameters, High altitude.

A survey was made of recent developments in meteorological sensors and measuring techniques from the surface up to an altitude of 150,000 feet. The results are presented as an annotated bibliography of 698 items, plus an analysis of the current status and of promising developments. Modes of atmospheric sounding are analyzed also. The text includes 108 references. Atmospheric parameters covered are: temperature, pressure, humidity, wind, density, radiation flux(solar and terrestrial), and ozone concentration. (Author)

AD-616 399 Div. 2/8, 9/4

RAND Corp., Santa Monica, Calif.
DYNAMIC SIMILARITY AND THE MODELING OF CLOUD DROPLETS,
by J. Doyne Sartor. 30 Oct 59, 7p
Rept. no. P-1829
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale. Submitted to the Journal of Meteorology.

Descriptors: (*Clouds, Drops), (*Raindrops, Models-(Simulations)), Atmospheric precipitation, Atmospheric motion, Hydrodynamics, Hydrostatics, Bouyancy, Electrostatics.

The motion of cloud droplet pairs can be modeled successfully in the laboratory by a variety of substances as long as R<<18. Since irregularly shaped particles may be considered as made up of droplet pairs, the fall velocity of irregularly shaped objects can be modeled under the same Reynolds number conditions. If the Reynolds number is kept small with respect to unity, theoretical solutions are evidently possible and the theory could be compared with observation. The coalescence of model droplets cannot be used as a direct indicator of collision, since coalescence depends critically on surface properties including electrostatic effects. (Author)

AD-616 409 Div. 2/7, 2/6

RAND Corp., Santa Monica, Calif.
THE UPPER ATMOSPHERE AND GEOMAGNETISM,
by E. H. Vestine. 3 Dec 59, 68p
Rept. no. P-1845
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Upper atmosphere, Terrestrial magnetism), (*Terrestrial magnetism, Upper atmosphere), Magnetic storms, Ionospheric disturbances.

05. Behavioral and Social Sciences

AD-615 762 Div. 28/5
CFSTI Prices: HC$2.00 MF$0.50

Institute of Behavioral Research, Texas Christian Univ., Fort Worth.
THE SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE,
by Nurhan Findikyan and S. B. Sells. Apr 65, 38p
Technical rept. no. TR-6
Contract Nonr343600
Unclassified report

Descriptors: (*Students, Group dynamics), (*Group dynamics, Students), (*Sociometrics, Students), Social psychology, Universities, Behavior, Classification, Factor analysis, Tables.

The investigation is part of a research program focused generally on the taxonomic investigation of physical and social environmental factors that account for variance in behavior. The present study involves an exploratory effort to group campus student organizations, varying in structural characteristics, into homogeneous clusters. To the extent that group structures influence the behavior of their members, such analysis is a significant step toward improved understanding of the sources of variance in human behavior.

AD-615 765 Div. 28/5
CFSTI Prices: HC$2.00 MF$0.50

Institute of Behavioral Research, Texas Christian Univ., Fort Worth.
ECOLOGY AND THE SCIENCE OF PSYCHOLOGY.
Special rept.,
by S. B. Sells. 8 Apr 65, 34p
Contract Nonr343600
Unclassified report

Paper presented at Southwestern Psychological Association, Oklahoma City, Oklahoma, April 8, 1965.

Descriptors: (*Behavior, Ecology), (*Ecology, Behavior), Psychology, Adjustment(Psychology), Adaptation(Physiology), Social psychology, Children, Animals, Humans, Theory.

The discussion reviews significant, converging developments contributing to the ecologic trend in psychology as well as issues and difficulties that must eventually be resolved. The presentation is focused principally on implications of the ecologic emphasis on content and method in psychology.

AD-615 766 Div. 28/5, 32/9
CFSTI Prices: HC$2.00 MF$0.50

New York State Univ., Buffalo.
FAMILY INTERACTION, COALITION, DISAGREEMENT, AND COMPROMISE IN PROBLEM, NORMAL, AND SYNTHETIC FAMILY TRIADS.
Doctoral thesis,
by Arthur M. Bodin. 6 May 65, 39p
Technical rept. no. TR-8
Contract Nonr437400
Unclassified report

Descriptors: (*Group dynamics, Decision making), (*Sociometrics, Group dynamics), Sociology, Social psychology, Game theory, Probability, Tables, Correlation techniques.

Three types of family triad were compared in two experimental situations. Problem families consisted of father, mother, and delinquent adolescent son. Normal families consisted of father, mother, and nondelinquent son. Synthetic families consisted of father, mother, and son from different natural families. These triads were matched closely on several demographic characteristics. There were 12 triads of each type. The two situations were (1) a competitive board game, as used in previous studies, and (2) a decision-making task in which individuals' initial differences were revealed so that pre-discussion agreement and post-discussion compromise could be ascertained on questions of special relevance to family life. There were important differences among the families in both situations. There were no overall differences in accommodative strategy in the board game, but significant differences in many specific aspects of play. On the questionnaire the synthetic families were in most disagreement initially and compromised most in reaching final consensus. Similar results occurred for the problem families, which were not significantly different from the normal families. In both types of authentic families the father-mother pairs were in closest agreement, whereas in the synthetic families the mother-son pairs were in closest agreement. The son compromised the most in all three types of families. The mother compromised the least in the normal families. The mother's role seemed crucial but different in the three types of triads. (Author)

AD-615 796 Div. 28/5, 32/9
CFSTI Prices: HC$3.00 MF$0.75

Rutgers - The State Univ., New Brunswick, N. J.
THREE STUDIES OF ORGANIZATIONAL AND INDIVIDUAL DIMENSIONS OF ORGANIZATIONS,
by Bernard P. Indik. May 65, 97p
Technical rept. no. TR-15
Contract Nonr40410
Unclassified report

Descriptors: (*Group dynamics, Sociometrics), (*Sociometrics, Group dynamics), Social psychology, Classification, Behavior, Decision making, Attitudes, Motivation, Performance(Human), Culture, Social communication, Personality, Aptitude tests, Perception-(Psychology), Management engineering.

The three studies considered in this report include a study of thirty-two package delivery organizations, thirty-six automobile sales dealerships and twenty-eight voluntary political-education organizations. The measures used in these studies were cast in taxonomic framework of the integration of studies of individual in groups which are embedded in organizational settings, which themselves are in a sociocultural environment. These three studies focus mainly on measures in four panels of that classificatory framework. These studies focus on the two organization level panels -- organization structure variables and organization process and function variables, and two individual level panels: first, organizationally relevant individual attitudes, perceptions, abilities, temperaments and motivations and second, relevant individual behavior variables. (Author)

AD-615 800 Div. 32/3, 24/2, 24/3
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Philadelphia, Pa. Missile and Space Div.
A STUDY ON THE APPLICATION OF MICROFILMING TO THE PRODUCTION, DISTRIBUTION, USE, AND RETRIEVAL OF TECHNICAL REPORTS.
Technical Information Series,
by John T. Salisbury. 30 Apr 65, 35p
Rept. no. 65SD249 Unclassified report

Descriptors: (*Information retrieval, Microfilm), (*Microfilm, Documentation), (*Documentation, Microfilm), Reports, Processing, Production, Distribution, Costs, Handling, Storage, United States Government, Department of Defense, Photographic processing equipment, Photographic techniques, Special purpose cameras.

The study includes introductory discussion on the need for documentation management and the applications of microfiche as means for better utilization of technical reports having an historic value. The microfiche in various forms is completely described and the many advantages of microfiche are given. Both the microfolio and the unitized methods of preparing microfiche are discussed from the standpoints of making and using them. A selection of surveyed equipment is included together with cost estimates and recommendations for implementing different microfiche preparation methods to handle a volume up to 3000 pages per month to a peak volume that is more than 3000 pages per month. (Author)

AD-615 813 Div. 32/3, 30/2
CFSTI Prices: HC$2.00 MF$0.50

Redstone Scientific Information Center, Redstone Arsenal, Ala.
AUTOMATION PROGRESS AT RSIC: THE STATUS OF ALPHA 1,
by F. E. Croxton. 2 Oct 63, 27p RSIC-92
Unclassified report

Prepared for delivery before the Annual Military Librarian's Workshop (th), White Oak, Md., 2 Oct 63.

Descriptors: (*Documentation, Systems engineering), (*Libraries, Automation), Reports, Periodicals, Textbooks, Recording systems, Magnetic tape, Military publications.

Progress report on ALPHA 1, the first study on an automated literature processing, handling, and analysis system. The system is devised to give information about the patron of the information center and about its holdings: books, periodicals, and documents. There are a patron tape record, arrayed by order of social security number, and master records for periodicals, books, and documents. Acivities in the system include recording and circulation of periodicals, circulation of books, binding of printed material, ordering and receiving books, producing accession lists, and the selective dissemination of information.

AD-615 844 Div. 18/3, 26/2, 30/1
CFSTI Prices: HC$3.00 MF$0.75

Assistant Secretary of Defense (Installations and Logistics), Washington, D. C.
DEPARTMENT OF DEFENSE GUIDE TO THE EVALUATION OF THE PERFORMANCE OF MAJOR DEVELOPMENT CONTRACTORS,
Special revised ed.
3 May 65, 53p
Unclassified report

Supersedes ed. dated 26 Jul 64, PB-181 549 Rev.; includes revised pages dated 3 May 65, PB-181 549A which are also separately available from CFSTI HC$1.00, MF$0.50.

Descriptors: (*Department of Defense, Research program administration), Handbooks, Reports, Costs, Standards, Scheduling, Management engineering.

The purpose of the Defense Program of Contractor Performance Evaluation is to provide an orderly and uniform method of determining and recording the effectiveness of contractors in meeting their contractual commitments under contracts for advanced development, engineering development and operational-systems development. The existence of this procedure will increase the importance to the contractor of satisfying his agreements in regard to cost, schedule and technical performance. The Program provides a long-term incentive to contractors by creating within the government a 'memory' of their performance and a means for considering his record in future actions relating to source selection. (Author)

AD-615 847 Div. 30/1, 25/4, 25/7

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA,
by D. S. Thompson and J. S. Waugh. 27 Oct 64, 1p
Contract DA36 039AMA03200E
Unclassified report

Pub. in Review of Scientific Instruments v36 n4 p552 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ruby, Lasers), (*Lasers, Standards), (*Standards, Intensity), Microwave spectroscopy, Electrons, Spin, Resonance.

AD-615 879 Div. 30/1
CFSTI Prices: HC$3.00 MF$0.75

Aerospace Technology Div., Library of Congress, Washington, D. C.
FOREIGN SCIENCE BULLETIN, VOL. 1, NO. 6. 1965.
Jun 65, 84p
TT 65-62403
Unclassified report

A monthly review of selected foreign scientific and technical literature sponsored by the Department of Defense.
Available copy will not permit fully legible reproduction.

Descriptors: (*Scientific research, USSR), Physics, Electronics, Mathematics, Astronomy, Cybernetics, Chemistry, Photosynthesis, Physiology, Electrochemistry, Ionosphere, High-pressure research, Superconductivity, Lightning, Microminiaturization(Electronics), Organic compounds, Siloxanes, Acoustics, Alkali metals, Single crystals, Ferroelectric materials, Rock(Geology), Polymers, Symposia.

Contents: Trends in the development of modern radioelectronics; Soviet physics-current and future problems; Soviet research on the effect of high pressures on superconductivity; Propagation of the ELF-VLF components of lightning discharges; A radio method for studying ionospheric parameters; Soviet scientific achievements during 1964: Mathematics, Physics, Astronomy, Power Engineering, Earth Sciences, Cybernetics, Chemical Sciences, Photosynthesis, Physiology; Electrochemical transducers for vibration and weight measurements; Status report on some aspects of reliability; Channel brightness of a nanosecond spark discharge; Grafting of organopolysiloxanes on chrysotile asbestos by means of an acoustic field; Obtaining alkali metals by carbon reduction; Growing ferroelectric alkali niobate and alkali tantalate single crystals; Symposium on the Physicomechanical properties of rocks in the upper part of the earth's crust; Polymer conference; Book reviews: Solids under the pressure and temperature conditions existing in the interior of the earth.

AD-615 884 Div. 32/4, 15/1

RAND Corp., Santa Monica, Calif.
AN OUT-OF-KILTER METHOD FOR MINIMAL COST FLOW PROBLEMS.
Revised ed.,
by D. R. Fulkerson. 5 Apr 60, 23p
Rept. no. P-1825
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
Revision of report dated 21 Oct 59.

Descriptors: (*Costs, Optimization), (*Distribution(Economics), Costs), Networks, Algebraic topology, Transportation.

A method of solving minimal cost network flow problems is described. This method begins with any circulation, feasible or not, and an arbitrary pricing vector. A labeling procedure is then used to adjust 'out-of-kilter' arcs, that is, arcs that fail to satisfy the optimality properties. It is shown that the method terminates in a finite number of steps, and that in so doing, the status of no arc of the network (as measured by certain 'kilter numbers') is worsened at any step. (Author)

AD-615 887 Div. 32/4, 32/8
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
RECENT EFFORTS TOWARD COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC,
by Oleg Hoeffding. 7 Aug 59, 25p Rept. no. P-1768
Unclassified report

Descriptors: (*Eastern Europe, Economics), (*Economics, Eastern Europe), (*USSR, Economics), Commerce, History, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania, Political science.

The purposes of the paper are (1) to review the record of the Soviet Bloc's Council on Economic Aid (CEMA) during the first 2 phases of its 10-year history (January 1949 through 1953, and 1954 until the middle of 1957, following the East European crises of 1956), and (2) to appraise principal features of the pattern of economic cooperation shaping up currently between the USSR and Eastern Europe. (Prepared for delivery at the 1959 annual meeting of the American Political Science Association, Washington, Sept. 10-12, 1959).

AD-615 907 Div. 23/5, 6/1, 18/7
CFSTI Prices: HC$2.00 MF$0.50

TRG, Inc., Melville, N. Y.
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE,
Final rept. for 1962-64,
by J. Kliphuis, J. J. Sjoblom, and J. Horowitz.
25 Sep 64, 40p
Contract N61339 1297
Unclassified report

Descriptors: (*Training devices, Antisubmarine warfare), (*Antisubmarine warfare, Training devices), (*Wake, Simulation), Sonar personnel, Detection, Sodium compounds, Borohydrides, Borates, Hydrogen, Sonar signals.

The possibility of generating an artificial wake by means of chemical, electrolytic, galvanic, or other method was investigated. The chemical method using sodium borohydride as an active hydrogen-generating ingredient was selected. An experimental vehicle was designed and various tests were made. The last test proved that the artificially generated wake showed the same characteristics on the sonar display as the wake of the submarine.

AD-615 910 Div. 32/8, 32/9, 18/7
CFSTI Prices: HC$4.00 MF$1.00

Naval Ordnance Test Station, China Lake, Calif.
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY,
by John L. Sorenson. Nov 64, 130p NOTS-TP-3583
Unclassified report

Descriptors: (*Political science, Venezuela), (*Unconventional warfare, Venezuela), (*Venezuela, Social sciences), Economics, Industries, Population, Government(Foreign), Armed forces(Foreign), Leadership, Guerrilla warfare, Sociology, Culture, Attitudes, Public opinion, Social communication.

The study exemplifies the use of knowledge derived from scholarly studies in the social sciences to lay the foundation for defenses against modern unconventional warfare. Unconventional warfare is defined as a system of conflict the strategy of which is to secure control of the state by first gaining control of its civilian population. The study is a follow-up to a pioneer attempt in the use of social science techniques, which treated the situation in South Vietnam. To determine how useful the procedures developed there would be when applied to a different situation, a brief investigation was conducted from June to August 1963 of unconventional warfare in Venezuela using the same procedural apparatus as in the Vietnam work. The results indicate that the system works well and that it works with speed, a systematic picture of the social structure of the modern nation of Venezuela having been produced in the remarkably short time of 3 months, using only the open literature. The report of findings follows the plan used for the Vietnam study. Four sections sketch the dynamics of the economic, political, military, and attitude-forming aspects of Venezuelan society; each section is followed by a discussion of the roles and groups most important to the aspect. Finally, a projection of what is likely to happen in the country in relation to unconventional war up to the end of 1966 is presented. A biographical file on key personalities, a glossary of abbreviations, and a bibliography are included. (Author)

AD-615 921 Div. 28/4
CFSTI Prices: HC$2.00 MF$0.50

Lockheed-Georgia Co., Marietta. Human Factors Research Lab.
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD,
Final rept. for Dec 62-Apr 64,
by Thomas J. Hall, George E. Passey, and Thomas W. Meighan. Mar 65, 27p
Contract AF33 657 10506, Proj. 1710, Task 171002
AMRL TR-65-22
Unclassified report

Descriptors: (*Job analysis, Performance(Human)), (*Attention, Psychometrics), Performance tests, Auditory perception, Reaction(Psychology), Signal lights, Colors, Targets, Identification, Students, Training, Decision making, Probability.

The study was conducted to obtain control data on the performance of three passive tasks--auditory vigilance, warning lights monitoring, and probability monitoring--performed previously in conjunction with three active tasks. Subjects were tested for 4 hours on each of 6 successive days. A task schedule requiring performance

of all six tasks was employed on 2 hours of each daily session, while performance on the passive tasks alone was carried out during the remaining 2 hours. Performance on auditory vigilance, green warning lights, and probability monitoring was found to be superior when these passive tasks were performed alone. No difference in performance was found for red warning lights. (Author)

AD-615 942 Div. 32/4
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOVIET AND COMMUNIST CHINESE INDUSTRIALIZATION STRATEGIES,
by K. C. Yeh. May 65, 48p Rept. no. P-3150
Unclassified report

Descriptors: (*USSR, Industrial production), (*China, Industrial production), Economics, Industries, Government(Foreign), Money, Agriculture, Transportation, Communication systems, Housing, Labor, Population, Communism.

The paper compares the Soviet and Communist Chinese strategies of industrialization during the period of their respective first two Five Year Plans (FYP), that is, 1928-37 for the Soviet Union and 1953-62 for Communist China. The discussion is limited mainly to three broad problems of development policy: the allocation of resources to investment, the priority of industry in the allocation of capital investment, and the choice of techniques and scale in industrial production.

AD-616 028 Div. 28/3, 16/12

Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
GALVANIC SKIN RESPONSE AFTER SLEEP DEPRIVATION,
by Laverne C. Johnson. 29 Jul 64, 1p
Proj. MR005 12 2304
Unclassified report

Research done in cooperation with San Diego State College Foundation, Calif., under Grant NSF GB922. Pub. in Psychological Reports v15 p549 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sleep, Galvanic skin response), (*Galvanic skin response, Sleep), Stress(Physiology), Electroencephalography, Pulse rate, Temperature, Respiration, Motor reactions.

Cortical activity (EEG), heart rate, skin temperature, respiration, vasomotor activity, and skin resistance were recorded during sleep from a 17-yr.-old boy after 264 hr. of wakefulness. With the onset of sleep all the autonomic variables except skin resistance showed an almost immediate reversion from an activated state to more normal levels. To determine the extent of this differing recovery rate for skin resistance, an examination of basal skin resistance and the GSR was made for the three recovery nights and the three post-recovery nights of sleep obtained 1 wk., 6 wk., and 2 mo. after sleep onset. There were no GSRs to external stimuli during the first recovery night although responses in the other autonomic variables were seen. Non-specific (spontaneous) GSRs, however, were present during the first recovery night, but the number were significantly less than recorded on subsequent recovery and post-recovery records. During the three recovery nights, there was no relationship between stage of sleep and frequency of non-specific GSR, but on the post recovery records non-specific GSRs were most frequent in Stage 4 followed by Stages 3, 2, REM, and Stage 1. (Author)

AD-616 112 Div. 26/2, 18/3
CFSTI Prices: HC$2.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa. Graduate School of Industrial Administration.
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZATION.
Management science research rept.,
by Charles H. Kriebel. Jan 65, 31p
Rept. no. MSRR-30
Contract Nonr76024, Proj. NR047 048
Unclassified report

Descriptors: (*Management engineering, Decision making), (*Decision theory, Statistical analysis), (*Communication theory, Statistical analysis), Costs, Linear systems, Inventory control, Distribution-(Economics), Logistics, Probability.

Propositions from team decision theory may be employed advantageously to resolve behavioral issues in the formal description of organizational decision processes. In specifying the information structure of an organization within the analysis of team problems it becomes useful to distinguish between components of the data generating process and the information system. An information system can be described completely in terms of (1) the space of organizational outcomes (or states of the world), (X sub i) = X; (2) the space of information, (Z sub k) = Z; and (3) the system likelihood function or conditional probability of each item of information, Z sub k, given the outcome, X sub i, for each Z sub k contained in Z and X sub i contained in X. The framework of applied statistical decision theory provides an operational procedure for the normative analysis of alternative decision rule programs and information systems. These considerations are illustrated for a simple logistics organization with operating costs given by a constrained asymmetric linear function of inventory and demand. In particular, both normal and extensive form analyses of the team decision problem are detailed under several logistics information systems. (Author)

AD-616 127 Div. 28/5
CFSTI Prices: HC$2.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
WIT AND HUMOR. AN ANNOTATED BIBLIOGRAPHY,
by Yvonne Treadwell Funkhouser. May 65, 37p
NOTS-AdPub-124
Unclassified report

Descriptors: (*Psychology, Bibliographies), (*Personality, Social psychology), Group dynamics, Anxiety, Attitudes, Motivation, Projective techniques, Reaction-(Psychology), Psychometrics, Sociometrics.

The bibliography contains annotated references to experimental work pertaining to humor along with abstracts of theoretical discussions on humor and laughter.

AD-616 148 Div. 28/4, 28/5

Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
THE RELIABILITY OF PERSONALITY RATINGS UNDER VARIED ASSESSMENT CONDITIONS,
by E. K. Eric Gunderson. 1965, 4p
Proj. MR005 12 2004, Task 1
Unclassified report

Pub. in Journal of Clinical Psychology v21 n2 p161-4 Apr 65 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Personality, Psychometrics), (*Psychometrics, Reliability), Adjustment(Psychology), Naval personnel, Projective techniques, Behavior, Polar regions, Medical personnel.

Pairs of clinical judges examined 719 Navy men and independently rated them on a series of personality traits. Assessment conditions varied in terms of similarity-dissimilarity of clinical methods and prior experience in a professional working relationship. Pearson correlations between judges were generally significant, but uniformly low, indicating that the judges could not agree with high consistency in evaluating specific personality attributes. Results indicated that differences in methods of clinical appraisal affected reliability, favorability, and variance of clinical judgments. The presence or absence of a previous professional working relationship between clinicians did not appear to influence agreement. Further quasi-experimental studies of the reliability of personality ratings should lead to better understanding of differences in clinicians' reactions to behavioral cues and hence to better control of clinical rating methods. (Author)

AD-616 153 Div. 32/4

California Univ., Los Angeles, Calif.
ECONOMIES OF SCALE IN THE SAVINGS AND LOAN INDUSTRY,
by Eugene F. Brigham. 1964, 17p
Unclassified report

Pub. in Western Economic Journal v3 n1 p7-20 fall 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Banking, Costs), Economics, Statistical analysis, California, Tables.

This paper presents the results of a detailed cost study of two cross-sectional samples of California savings associations. The first includes practically all associations in the state and examines a relatively large number of cost-determining variables, but the data are restricted to the year 1961. The second has a time dimension, since it includes seven sets of cross-sectional observations from 1956 through 1962, but the data are for only state-chartered associations operating in Los Angeles County. Only associations that have been operating for two or more years are used in the regression analysis. Conclusions and qualifications: The savings and loan industry does not appear to be subject to very significant economies of scale. The present indicates that internal economies largely disappear when new and atypical associations are removed from the sample, and when additional cost-determining variables are introduced into the model. This lack of importance of scale economies seems to hold regardless of whether operating efficiency is measured by costs, returns or assets, or profits, and regardless of whether or not public holding company affiliates are treated as one institution. There is some evidence of economies of scale in the savings and loan industry, but these size-generated efficiencies do not appear to be very important. Until internal economies are more visibly demonstrated, public policies based on the assumption that they exist in fact are possibly misguided.

AD-616 175 Div. 32/3

Herner and Co., Washington, D. C.
BASIC PARAMETERS OF RETRIEVAL TESTS,
by R. A. Fairthorne. 1963, 3p
Contract AF49 638 1261
AFOSR 65-0593 Unclassified report

Pub. in American Documentation Institute. Proceedings p343-5 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Information retrieval, Test methods), Tables, Tests.

Retrieval tests involve comparison of two partitions of the collection, by the system and by the tester. Parameters should hold good both for 'all-but-not-only (ABNO) and 'only-but-not-all' (OBNA) systems; when there are no items of the type invoked; and when 'discrimination' is separated from 'identification'. Thus they are functions of those parameters of the 2x2 contingency table unaltered, except for sign, by row or column interchange. These are interpreted in documentary terms. (Author)

AD-616 196 Div. 28/5, 32/9

Rutgers - The State Univ., New Brunswick, N. J.
JAPANESE VS. AMERICAN VALUES,
by F. Kenneth Berrien. 30 Jul 64, 14p
Technical rept. no. TR-18
Contract Nonr40410
Unclassified report

Pub. in Journal of Social Psychology v65 p181-91 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Japan, Culture), (*Culture, Social psychology), United States, Attitudes, Students, Behavior, Group dynamics, Personality, Government-(Foreign), Sociology, Decision making, Performance-(Human).

The article portrays the Japanese in comparison with Americans as being more deferent, more respectful of and dependent upon high status persons, more self-abasing, and more willing to work long hours. Individual aspirations appear to be less important than the achievements of work groups. The boundaries of their interests and concerns are more limited than seems to be true of Americans, but their loyalty to family and work is greater. It is evident that the external signs of Occidental influence and the political democratic structures established by the postwar Occupation are not matched by internalized values, which many believe are a bedrock upon which a democratic society rests. Nominally Japan is democratic, yet it retains many well ingrained personal values that appear to contribute to the traditional, nondemocratic prewar social patterns.

AD-616 233 Div. 28/5

Michigan Univ., Ann Arbor.
INDIVIDUAL TASK PERFORMANCE IN A CHANGING SOCIAL STRUCTURE,
by Eugene Burnstein and Robert B. Zajonc. 1965, 15p
Contract Nonr122434, Proj. NR170 309
Unclassified report

Pub. in Sociometry v28 n1 p16-29 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Group dynamics, Performance(Human)), (*Motivation, Adjustment(Psychology)), Reaction-(Psychology), Social psychology, Reflexes.

The study deals with the relationship between changes in status and task performance involving simple reaction time responses. Status is manipulated by assigning to group members different degrees of control over the group product and by subsequently creating conditions which require that control be reallocated. The degree of control members have over the group product defines their status rank in the group. Two experiments are presented in which performance effects deriving from status changes are examined. In the first, the highest ranked member is demoted and the lowest ranked member

is promoted. In the second experiment, members of intermediate ranks are shifted both up and down. These experiments demonstrate that a member's performance improves when his status is increased and his performance suffers when his status is decreased. (Author)

AD-616 265 Div. 28/5
CFSTI Prices: HC$6.00 MF$1.50

California Univ., Los Angeles. Dept. of Psychology.
A BIBLIOGRAPHY OF PUBLICATIONS RELATING TO THE SMALL GROUP.
3rd ed.
by Bertram H. Raven. Apr 65, 243p
Technical rept. no. TR-15
Contract Nonr23354, Proj. NR171 350
Unclassified report

Descriptors: (*Social psychology, Bibliographies), Group dynamics, Social communication, Personality, Behavior, Perception(Psychology), Stress(Psychology), Psychometrics.

The original bibliography of articles and books relating to the small group is revised to include a total of 3137 items. The listings are alphabetical according to name of first author. Included is an index according to subject matter and an index by secondary authors. (Author)

AD-616 279 Div. 28/5, 32/9, 23/1
CFSTI Prices: HC$2.00 MF$0.50

Emory Univ., Atlanta, Ga.
A MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS,
by Arthur M. Cohen. 1965, 49p
Contracts Nonr49205, Nonr114114
Unclassified report

Descriptors: (*Group dynamics, Adjustment(Psychology)), (*Social communication, Adjustment(Psychology)), (*Adjustment(Psychology), Mathematical models), Social psychology, Sociometrics, Decision making, Personnel management, Reviews, Reaction-(Psychology).

AD-616 290 Div. 28/5, 32/9
CFSTI Prices: HC$2.00 MF$0.50

Princeton Univ., N. J.
UPON THE PARETO OPTIMALITY OF GROUP BEHAVIOR.
Econometric Research Program,
by C. Tisdell. 10 May 65, 33p
Research memo. no. ERP-RM-76
Contract Nonr185816
Unclassified report

Supported partially by the Carnegie Corp., New York.

Descriptors: (*Group dynamics, Behavior), (*Sociometrics, Group dynamics), Sociology, Social psychology, Theory, Mathematical models.

Some of the conditions for and obstacles to Pareto optimality of group behavior are considered. Special emphasis is put upon those obstacles which arise from the imperfection of man's knowledge yet these obstacles are not given inclusive attention. It is found to be convenient to discuss these questions for 'societies' which involve limiting states of inter-dependence since they give insights into the non-limiting cases. The term 'society' is used to designate any group which is independent of another. It follows that nearly every collection of existing individuals cannot form a 'society' and that a more general formulation is required. Formulations are given which enable us to conceptualise some conditions which render it impossible for a group to ensure Pareto optimality for itself. It is suggested that such conditions will commonly prevail. (Author)

AD-616 292 Div. 32/4
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
ON ECONOMIC ENTROPY.
Econometric Research Program research paper,
by Kazuo Mizutani. Apr 65, 18p
Rept. no. ERP-RP-11
Unclassified report

Descriptors: (*Economics, Mathematical models), Probability, Stochastic processes, Money, Consumption, Distribution(Economics), Sociology, Theory.

AD-616 293 Div. 28/5, 32/9
CFSTI Prices: HC$1.00 MF$0.50

Stanford Univ., Calif. Graduate School of Business.
RELATION BETWEEN TALKING AND SOCIOMETRIC CHOICES,
by Hans E. Lee and Thomas W. Harrell. Apr 65,
13p Technical rept. no. TR-10
Contract Nonr22562, Proj. NR171 388
Unclassified report

Report on Perception of Leadership in Small Groups.

Descriptors: (*Sociometrics, Verbal behavior), (*Verbal behavior, Sociometrics), (*Group dynamics, Verbal behavior), Social communication, Leadership, Perception(Psychology), Decision making, Attitudes, Social psychology.

Twelve case discussion groups, each consisting of five first year Master of Business Administration students, met for four sessions. After the first and fourth session, each group member completed a sociometric questionnaire which asked him to rank all the participants on (1) who contributed the best ideas, (2) who participated the most, (3) who guided the discussion, (4) who was the leader and (5) whom he liked. In addition, during the entire discussion, which lasted a maximum of 30 minutes, a continuous recording was made of the time each participant talked. The time was converted to a rank order, making a sixth ranked characteristic. When the average rank order on each characteristic was computed, holding the rank order on one of them constant, the data suggested that during the first sessions, each characteristic was positively and highly associated with talking. There was a single exception, namely, that the rank order on liking was not related to the rank order on any other characteristic. When the average rank orders were examined for the fourth session, however, this changed. There was a decided increase in the association of the ranks on liking with the other characteristics. Hence, after the fourth session, the rank orders on each of the six characteristics were highly and positively associated and there was no evidence of role differentiation. (Author)

AD-616 294 Div. 28/5, 30/2
CFSTI Prices: HC$2.00 MF$0.50

Tufts Univ., Medford, Mass.
STEPS TOWARD COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR,
by Thornton J. Roby and Raymond S. Nickerson.

1963, 43p
Contract AF19 628 2450
ESD TDR-63-629

Unclassified report

For presentation at DECUS ANNUAL MEETING Nov 18, 19, 1963 at Lawrence Radiation Laboratory.

Descriptors: (*Group dynamics, Simulation), Models-(Simulations), Computers, Behavior, Effectiveness, Mathematical analysis, Performance(Human).

The general objective of the work to be described is to develop a simulation model to be used for investigating certain aspects of the performance of man-machine systems. The model will incorporate behavior and effectiveness of the human component, ordinarily a small group or team, and other parameters describing important properties of the task environment. Assuming definite functional relations between these sets of parameters and specific numerical values, it will attempt to predict the critierial performance of the total system.

AD-616 296 Div. 23/4, 28/1
CFSTI Prices: HC$1.00 MF$0.50

Training Research Lab., Univ. of Illinois, Urbana.
ESSENTIAL PRINCIPLES OF PROGRAMED INSTRUCTION,
by Lawrence M. Stolurow. Jun 65, 13p
Technical rept. no. TR-8
Contract Nonr398504, Proj. NR154 239

Unclassified report

Report on Research on Pre-Programed Self-Instruction and Self-Programed Individualized Education.

Descriptors: (*Education, Teaching machines), (*Teaching machines, Education), Training devices, Instructors, Students, Learning, Theory.

AD-616 305 Div. 32/4
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
TOWARD A GENERAL THEORY OF CUSTOMS UNION FOR DEVELOPING COUNTRIES,
by C. A. Cooper and B. F. Massell. May 65, 28p
Rept. no. P-2919-2

Unclassified report

Descriptors: (*Economics, Government(Foreign)), (*Commerce, Government(Foreign)), Industries, Industrial production, Costs, Distribution(Economics), Decision making, Theory.

The present study attempts to lay a cornerstone for a more general theory of customs unions in less-developed countries (LDCs). The conditions under which a protectionist policy makes good sense are not examined; rather industrialization is accepted as a legitimate policy goal and membership in a CU is considered insofar as it may enable an LDC to achieve more economically the ends served by protection.

AD-616 306 Div. 32/4
CFSTI Prices: HC$6.00 MF$1.25

RAND Corp., Santa Monica, Calif.
SOVIET NATIONAL INCOME AND PRODUCT, 1958-1962: PART I, NATIONAL INCOME AT ESTABLISHED PRICES,
by Abraham S. Becker. Jun 65, 210p
Rept. no. RM-4394-PR
Contract AF49 638 700

Unclassified report

See also AD-276 933.

Descriptors: (*Economics, USSR), (*USSR, Economics), Costs, Distribution(Economics), Money, Budgets, Government(Foreign), Agriculture, Industrial production.

The second chapter of the study is devoted to evaluation of the accuracy of major income and outlay aggregates in the accounts. Household incomes are appraised on the basis of statements in Soviet sources citing increases in 'money incomes' over specified intervals. On the basis of alternative interpretations of the scope of the term in the various statements, it seems reasonable that the household income and outlay estimates of the Memorandum are not inconsistent with the independent yardsticks. Public sector outlays are appraised by means of a reconciliation with the Soviet state budget. It is concluded that the accounts presented here underestimate these outlays by amounts that at a maximum grow from 3.4 billion rubles in 1958 to 4.7-5.0 billion rubles in 1961-1962. Chapter III comments on some of the implications of the national income estimates. Discussion of the sources of household incomes points up the increase in the share of nonagricultural wages and salaries between 1958 and 1962 and the decline in the relative weight of agricultural incomes; there appears to have been little change in the relative importance of transfer incomes. At a first approach, the proportion of total household outlays devoted to consumption appears to have increased, while the role of investment and transfer outlays (savings and taxes) declined. Evidence is then adduced that the negative statistical discrepancy in the household income account in 1961-1962 reflects increments in currency held by the population, rather than errors in the estimates.

AD-616 319 Div. 32/4, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
COMPOSITION OF GENERAL SUM GAMES.
Econometric Research Program,
by Bezalel Peleg. Apr 65, 10p
Research memo no. RM-74
Contract Nonr185816

Unclassified report

Descriptors: (*Game theory, Economics), (*Economics, Game theory), Set theory, Operations research.

A description of the structure of the von Neumann and Morgenstern solutions of a composition of general sum cooperative games is given. A solution of a composition determines uniquely the transfer of money between the component games and is the cartesian product of its projections on the payoff spaces of the component games. The transfer is limited only by the requirement that for each payoff vector in the solution, both the two sets of players of the components have non empty effective subsets.

AD-616 323 Div. 32/2
CFSTI Prices: HC$7.50 MF$1.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
ASPECTS OF THE THEORY OF SYNTAX,
by Noam Chomsky. Oct 64, 258p
Contract AF19 628 2487
ESD TDR-65-157

Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass., Grants MH05120 05, MH05120 04.

Descriptors: (*Language, Analysis), Theory, Learning, Textbooks.

Contents:
Methodological preliminaries: Generative grammars as theories of linguistic competence; theory of performance; organization of a generative grammar; justification of grammars; formal and substantive grammars; descriptive and explanatory theories; evaluation procedures; linguistic theory and language learning; generative capacity and its linguistic relevance
Categories and relations in syntactic theory: Scope of the base; aspects of deep structure; illustrative fragment of the base component; types of base rules
Deep structures and grammatical transformations
Residual problems: Boundaries of syntax and semantics; structure of the lexicon.

AD-616 326 Div. 23/1

Iowa State Univ., Iowa City.
THE CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES AIR FORCE.
Master's thesis,
by Roger Alan Crabbs. 1 Apr 65, 82p
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Personnel management, Air Force), (*Air force personnel, Personnel management), (*Management engineering, Air force personnel), Officer personnel, Reports, Effectiveness, Military personnel, History, Decision making, Behavior.

Contents: Effectiveness reporting: Evolution of informal effectiveness evaluation; Early military evaluation of personnel; Army appraisal systems--World War I to 1947; Effectiveness evaluation in the USAF; Present USAF program; Management process: Management defined; Approaches to management; Understanding the process of management; USAF Management approach: Role of the Air Force officer; Air Force process of management; The new approach.

AD-616 327 Div. 28/5
CFSTI Prices: HC$3.00 MF$0.75

Group Effectiveness Research Lab., Univ. of Illinois, Urbana.
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS,
by Willem Meuwese and Fred E. Fiedler. Mar 65, 59p Technical rept. no. TR-22
Contract Nonr183436, Proj. NR177 472
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Group dynamics, Stress(Psychology)), (*Stress(Psychology), Leadership), (*Leadership, Group dynamics), Performance(Human), Attitudes, Anxiety, Correlation techniques.

The experiment investigated the influence of the leader's ability and interpersonal attitudes toward co-workers on the creative performance of discussion groups on two tasks and under three conditions of stress. Interpersonal attitudes were measured by means of the leader's esteem for his least-preferred co-worker (LPC) which had yielded consistent relations with group performance in previous studies. Fifty-four three-man groups, composed of senior cadets of the Army and Navy Reserve Officers Training Corps program participated. Nine groups in each condition had high and nine had low LPC leaders. Internal stress was induced by the task which engendered divisive attitudes in groups in which Army and Navy cadets were to work together; external stress was induced by having senior Army Field officers closely watch and rate the groups of Army cadets while they were working; the control condition attempted to minimize stress by de-emphasizing the military aspects of the problems and by assuring the men that their performance would not affect their records. On the first task the more directive, managing, low LPC leaders had better performing groups in the control condition; the more non-directive, permissive, human relations-oriented (high LPC) leaders had better performing groups in the internal stress condition. No differences were found in the external stress condition. On the second task, low LPC leaders performed better in all conditions. (Author)

AD-616 334 Div. 32/7, 28/5, 16/12
CFSTI Prices: HC$3.00 MF$0.75

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY,
by Eilhard von Domarus and Warren S. McCulloch. Mar 34, 73p
Contract DA36 039AMC03200E, Grant NSF GP2495
Unclassified report

Pub. with introduction by Warren S. McCulloch in 1965.

Descriptors: (*Psychology, Theory), (*Psychiatry, Theory), Humans, Language, Nervous system, Conditioned reflex, Social psychology, Mathematical logic, Statistical mechanics, Biology, Biophysics, Relativity theory, Embryology, Adaptation(Physiology), Emotions, Mental disorders.

The history of both physics and mathematics shows that the only escape from an antiquated metaphysic is into the metaphysic subsumed by the systematic context of the symbols requisite to convey experience in its achieved distinction. In the so-called mental sciences the necessity of this process becomes obtrusive. Chapter one of this paper is the description of it as obvious in psychology; chapter two, of its subtle appearance culminating in explicit formulation in physics. These chapters are intended to provide the systematic context for the symbols Mind and Matter. The notions intended are conjugate abstrata analyzing all entities concrete in experience. They are such that, on account of the giveness of fact, neither can be supposed without the other. Chapter three relates these notions so as to formulate, symbolically, 'Minding' and 'Mattering' as exhibited in the development of propositionalizing issuing in the logical structure of mind.

AD-616 342 Div. 32/3
CFSTI Prices: HC$4.00 MF$0.75

General Electric Co., Bethesda, Md. Information Systems Operation.
INDEXING AIDS, PROCEDURES AND DEVICES.
Final rept.,
by Arthur L. Korotkin, Lawrence H. Oliver, and

Donald R. Burgis. Apr 65, 110p
Contract AF30 602 3435, Proj. 4594, Task 459401
RADC TR-64-582

Unclassified report

Descriptors: (*Subject indexing, Analysis), Information retrieval, Automatic, Instruction manuals, Textbooks, Dictionaries, Indexes.

The purpose of this study was to analyze proposed and available techniques and devices designed as aids to the manual indexing operation in order to identify those manual and semi-automatic techniques and devices which increase the speed, accuracy, and consistency of indexers. Three modes of data collection were used: (1) Review of the Literature, (2) Visits to pertinent facilities, and (3) A mail survey of relevent technical information agencies and private manufacturers. The major results of this study were: (1) Eight classes of indexing aids were identified and are discussed in detail with regard to their rationale, development, and application. (2) Little experimental or objective data are available regarding the development or effectiveness of indexing aids. (3) No mechanical devices were identified which were specifically designed as aids to the manual indexing operation. The results of this study indicate that if the manual indexing process is to be optimized, a greater effort must be expended in the direction of objectively and quantitatively studying the indexer, the indexing operation, and the techniques for improving indexer performance. (Author)

AD-616 359 Div. 26/2, 18/3
CFSTI Prices: HC$1.00 MF$0.50

Center for Naval Analyses, Franklin Inst., Philadelphia, Pa.
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES.
Final memo.,
by J. W. Noah. 19 Mar 65, 12p CNA-43-65
Contract Nonr373200

Unclassified report

Descriptors: (*Costs, Military requirements), (*Navy, Management engineering), (*Logistics, Costs), Naval research, Analysis, Weapon systems, Armed forces operations, Armed forces budgets, Economics.

This document reports the plans and activities of the cost analysts within the Center for Naval Analyses (CNA). It is intended to inform and draw comments from interested Naval officers associated with Center for Naval Analyses, from the management and project leaders in CNA, and from those outside of CNA engaged in similar activites. (Author)

AD-616 368 Div. 23/4, 32/9
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE FAILURE OF THE UNIVERSITIES. I: SCIENTIFIC AND TECHNOLOGICAL,
by Richard Bellman. 28 Sep 59, 31p
Rept. no. P-1805

Unclassified report

Descriptors: (*Universities, Theory), Culture, Social sciences, Students, Instructors, Survival, Mathematics.

A discussion is presented on the lack of universality of the university, of the artificial images of the 'intellectual man' and the 'practical man,' and, generally, of life, liberty, and the pursuit of knowledge. (Author)

AD-616 404 Div. 32/11
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
GUIDE TO RUSSIAN REFERENCE AND LANGUAGE AIDS: AN ANNOTATED BIBLIOGRAPHY.
Revised ed.,
by Rosemary Neiswender. Jan 62, 83p
Rept. no. P1837-1

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. Revision of manuscript dated Nov 59.

Descriptors: (*Language, USSR), (*Bibliographies, Language), Textbooks, Education, Dictionaries, Indexes, Sources.

The following compilation is offered to librarians, students, translators, and researchers as a practical working bibliography of current Russian reference and linguistic materials. It is the outgrowth of a day-to-day use of these materials in a research library concerned largely with Soviet studies. In view of the increasing significance of Soviet science and technology, the bibliography is confined almost entirely to those areas, and does not attempt to cover the social sciences or humanities. Neither does it attempt to be historically inclusive; instead, entries have been limited as far as possible to publications issued since World War II and still in print. Appended to the bibliography are a brief description of Russian transliteration systems (the Library of Congress system has been used throughout the present work), a selective listing of U.S. and foreign dealers in Russian books and periodicals, a list of abbriviations of Soviet publishing houses, and an author-title index to the citations.

AD-616 406 Div. 32/8, 18/7
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE CONTEXTUAL STUDY: A STRUCTURED APPROACH TO THE STUDY OF POLITICAL AND MILITARY ASPECTS OF LIMITED WAR.
Revised ed.,
by J. W. Ellis, Jr. and T. E. Greene. 10 May 60, 21p
Rept. no. P-1840

Unclassified report

Revision of manuscript submitted 11 Nov 59.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Limited war, Analysis), Game theory, Political science, Probability.

Study of militaryproblems in limited war by conventional techniques of systems analysis or operations analysis is hampered by the dominating effect of nonquantifiable variables, such as political factors. Such variables interact with the military factors in a complex fashion: the relation is dynamic, so that political and military problems cannot be separated, and it changes continually throughout the course of a limited war. Static assumptions regarding political constraints form unreliable boundary conditions within which to consider desired military tactics or weapons characteristics. A structured analytical method termed contextual study is suggested, whereby the military and political factors of the environment of a limited war are considered simultaneously throughout a compaign or series of campaigns. Advantages and limitations of the method and distinctions between it and operational war gaming are discussed. Applications to other types of problems than limited war--problems involving

close interaction among quantifiable and nonquantifiable factors--are suggested. (Author)

AD-616 411 Div. 32/4, 15/1, 15/2

RAND Corp., Santa Monica, Calif.
QUASI-CONCAVE PROGRAMMING,
by Kenneth J. Arrow and Alain C. Enthoven.
16 Dec 59, 39p Rept. no. P-1847
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Nonlinear programming, Functional analysis), (*Economics, Nonlinear programming), Statistical analysis, Distribution(Economics), Probability, Convex sets, Calculus of variations.

AD-616 412 Div. 32/4, 32/8
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
AN INDEX OF SOVIET INDUSTRIAL OUTPUT.
Revised ed.,
by Norman M. Kaplan and Richard H. Moorsteen.
2 Mar 60, 41p Rept. no. P-1848
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Economics, USSR), (*Industrial production, USSR), Industries, Statistical data, Counting methods, Determination, Measurement.

In this paper we present (a) the results of a calculation of an index of Soviet industrial output and (b) some comments on, and applications of, these results. Underlying this paper are two studies: one on machinery prices and production and another, which incorporates the relevant results of the machinery study, on the output of all industrial products. This paper is a summary of the second of these studies and, as such, omits the detailed documentation and explanations which are available there or which, with respect to the machinery component, will be available when the machinery study is published. The results are presented here, shorn of important details, because the topic appears to be of some current interest. The results, however, are tentative for a variety of reasons; some of them are indicated below but others appear only in the underlying materials. In Section I we present the index of industrial output and briefly discuss its nature and limitations. Section II is a miscellany in which we: (a) compare our index with others; (b) discuss some dynamic aspects of Soviet industrial growth; (c) explore the indications of future rates of growth; (d) present an index of the output of final products; and (e) estimate changes in productivity. (Author)

AD-616 414 Div. 32/8, 18/1

RAND Corp., Santa Monica, Calif.
IS DETERRENCE ENOUGH OR SHOULD WE BE PREPARED TO FIGHT A GENERAL WAR IN THE 1960's
by E. J. Barlow. 11 Dec 59, 20p
Rept. no. P-1850 Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Deterrence, Defense systems), (*Political science, Deterrence), Nuclear warfare, Civil defense systems, Cold war, Foreign policy, Radioactive fallout, Radiation hazards, Attitudes, Decision making.

AD-616 417 Div. 32/8, 32/9
CFSTI Prices: HC$4.00 MF$0.75

RAND Corp., Santa Monica, Calif.
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW,
by John R. Thomas. 15 Mar 60, 107p
Rept. no. P-1859
Unclassified report

Descriptors: (*Public opinion, USSR), (*USSR, Attitudes), (*Attitudes, USSR), Culture, Communists, Religion, United States Government, Foreign policy, Political science, Population, Social communication, Sociology, Economics, Government (Foreign), Leadership, China.

AD-616 424 Div. 32/2, 32/9, 30/2

RAND Corp., Santa Monica, Calif.
AUTOMATIC LANGUAGE-DATA PROCESSING IN SOCIOLOGY,
by David G. Hays. 29 Dec 59, 33p
Rept. no. P-1866
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
Available from CFSTI as PB-166 178, HC$2.00, MF$0.50.

Descriptors: (*Sociology, Data processing systems), (*Language, Analysis), Digital computers, Social communication, Verbal behavior, Statistical analysis, Reliability.

The use of computers in analysis of mass communications, interaction transcripts, and other sociological data couched in natural language is possible. A method of grammatic analysis is described, and techniques for automatic content analysis and interaction process analysis are sketched. The need for research on the relations between linguistic and social variables is emphasized. (Author)

AD-616 428 Div. 32/4, 26/2
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES,
by Thomas A. Marschak. 15 Jan 60, 44p
Rept. no. P1871
Unclassified report

Descriptors: (*Economics, France), (*Industries, France), (*Production control, Government(Foreign)), Management engineering, Management planning, Theory, Political science.

Welfare economics has produced no theorems prescribing Pareto-optimal behavior for public monopolies operating under all the constraints which face the French nationalized industries and departing in their many ways from the smooth, certain world of existing theory. The closest that theorists have come is to obtain rules for some of the important decisions under one of the major current constraints (balanced budgets) when the rest of the economy is perfectly competitive; to approximate even these rules

requires calculations infeasible at present. But pricing, investment, and other decisions must be made here and now. The ideal solutions of welfare economics, appropriately touched up to meet the constraints, and approximated to the extent that analytical resources allow, have provided, in the French experience, usable investment and pricing procedures; in at least one major case (the Tarif Vert) there can be little dispute that the result has been an improvement over previous practice. There is hoped that similar improvement in pricing will occur in time in the other industries. With respect ot investment choices, there is massive agreement that present-value rankings made for several interesting discount rates are better than any alternative practical procedures; the rankings certainly compare favorable with analyses actually used in the past for investment choices in government water resource development in the US. Had there been a great deal of worrying over the shortcomings of the ideal solutions compared to more realistic second-best solutions, or over the distributive effects of policy changes, these pricing and investment procedures might never have been developed. There is no doubt, at any rate, that the work of the French economists has proved fruitful to France.

AD-616 429 Div. 32/4

RAND Corp., Santa Monica, Calif.
TAXATION AND THE DEMAND FOR ALCOHOLIC BEVERAGES,
by W. A. Niskanen. 11 Jan 60, 17p
Rept. no. P-1872
Unclassified report

Presented to the Econometric Society on 29 Dec 59 in Washington, D. C.
Availabeonly for reference use at DDC Field Services.
Copy is not available for public sale.

Descriptors: (*Economics, Alcohols), (*Alcohols, Consumption), Costs, Population, Wages, Least squares method, Control.

The paper presents a study of the characteristics of aggregate consumer demand for alcoholic beverages and the influence of changes in the alcoholic beverage taxes on this aggregate demand. Estimates of these effects shed some light on the normative question of the effectiveness of these taxes as instruments of public policy. Part I presents an econometric model of the markets for distilled spirits, beer, and wine. Part II suggests and tests three hypotheses to explain the changes in the actual tax rates since 1934.

AD-616 430 Div. 32/4

RAND Corp., Santa Monica, Calif.
THE TERMS OF SOVIET-SATELLITE TRADE: A BROADENED ANALYSIS,
by Horst Mendershausen. 7 Jan 60, 52p
Rept. no. P-1873
Unclassified report

For publication in The Review of Economics and Statistics.
Available only for reference use at DDC field services.
Copy is not available for public sale.

Descriptors: (*Economics, USSR), (*Commerce, USSR), Government(Foreign), Foreign policy, East Germany, West Germany, Finland, Egypt, Europe, Eastern Europe, Costs, Statistical analysis, Tables.

The study led to the following findings about Soviet export prices: (1) Individual Satellite countries experienced different average degrees of price discrimination on Soviet exports. The discrimination effect tended to be stronger for the Balkan countries than for Poland, Czechoslovakia and East Germany. Poland was the only Satellite that enjoyed a continual decline in the degree of Soviet export price discrimination over the period as a whole. (2) In comparison to West Germany, East Germany's terms on Soviet exports were, on the average, consistently unfavorable during the period. (3) Finland and Egypt, two non-Bloc countries with especially close trade ties to the Soviet Union, tended to pay more for Soviet exports than did Free Europe as a whole, but less than the Satellites. (4) Soviet export prices to the Satellites showed sizable year-to-year fluctuations, for individual commodities. But the uneven timing of these fluctuations from commodity to commodity, which was caused by the noted lag effects, tended to smooth out the movements of a general index of Soviet export prices to the Satellites, relative to an index of such prices to Free Europe.

06. Biological and Medical Sciences

AD-615 771 Div. 31/6, 29/5
CFSTI Prices: HC$2.00 MF$0.50

Navy Experimental Diving Unit, Washington, D. C.
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 1. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS.
Interim rept.,
by M. W. Goodman. 15 Jan 65, 44p
Research rept. RR-3-64
Proj. S F011 06 03, Task 3380
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Breathing apparatus, Design), (*Absorption, Carbon dioxide), (*Carbon dioxide, Breathing apparatus), Performance(Engineering), Compressed air, Containers, Cylindrical bodies, Respirators, Life support.

Cylindrical SCUBA canisters, packed with granular Baralyme, were tested with a mechanical respirator. Breathing resistance was observed to vary linearly and in direct proportion to the length-diameter ratio when airflow was of less than critical or pre-critical magnitude. Duration of useful canister life (end-point at 0.5% CO2) was determined to be a function of canister size, i.e., volume and quantity of absorbent. Efficiency, however, correlates closely with the packed granular column length of iso-diameter, adequate-size canisters. Dimensions of low-flow-impedance, minimal-capacity canisters are governed by the absorptive wave-reactive-zone volume and the empirically-stipulated diameter. Methods for determining size, capacity and dimensional ratios of low resistance, efficient, duration-specific canisters are considered, together with the gas flow and composition parameters, the specific environmental hazards facing closed-circuit oxygen swimmers, and related factors of significance in these respects. (Author)

AD-615 775 Div. 16/4, 13/4
CFSTI Prices: HC$2.00 MF$0.50

Naval Civil Engineering Lab., Port Hueneme, Calif.
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS. VII.
Rept. for 15 Aug 63-15 Aug 64,
by T. Roe, Jr. and H. Hochman. May 65, 41p
Technical rept. no. R-380
Proj. Y R005 07 01 007
Unclassified report

See also AD-600 915.

Descriptors: (*Marine borers, Pest control), (*Pest control, Marine borers), (*Molluscacides, Effectiveness), Mollusca, Crustacea, Inhibition, Protective coverings, Impregnation, Wood, Preservation, Creosote, Tar, Organic compounds, Metalorganic compounds, Toxicity.

The Laboratory is exposing wood panels impregnated with various materials to determine their resistance to attack by marine borers. This report lists the results of harbor tests of treated panels removed from exposure between 15 August 1963 and 15 August 1964. It also lists all treated panels which have been exposed for 1 year or more and which have shown no attack or insufficient attack to warrant removal. When impregnated into wood test panels, creosote and 70-30 creosote-coal tar solution are about equally effective against Martesia and teredine attack, but neither is effective against Limnoria. The addition of certain organic or metal-organic compounds to creosote or creosote-coal tar solution produces a preservative which is superior to creosote or creosote-coal tar solution alone. Treatments containing a combination of one material specifically toxic to Limnoria and another material specifically toxic to teredine borers are also showing promise as preservative systems. Certain tropical woods have performed well at Port Hueneme but have failed at Pearl Harbor because of Martesia attack. (Author)

AD-615 814 Div. 16/1
CFSTI Prices: HC$3.00 MF$0.75

Linde Div., Union Carbide Corp., Tonawanda, N. Y.
THE PHYSIOLOGICAL EFFECTS OF ARGON, HELIUM AND THE RARE GASES.
Technical rept.,
by H. R. Schreiner. 31 May 65, 76p
Contract Nonr4115 00, Proj. NR102 597
Unclassified report

Descriptors: (*Helium group gases, Physiology), (*Physiology, Helium group gases), Nitrogen, Oxygen, Oxidoreductases, Cells(Biology), Mammals, Tissue culture cells, Growth, Metabolism, Pressure, Inhibition, Neurospora.

The report describes some physiologic effects of helium, neon, argon, krypton, xenon, and of several other normally chemically inert gases such as nitrogen. The observations show that chemically inert gases are endowed with molecular properties which enable them to affect biological processes in a systematic and most likely, universal manner. At an equivalent depth of 980 feet of seawater, (30.6 atm) helium, neon, nitrogen, argon and nitrous oxide significantly ($p < 0.005$) inhibit the activity of tyrosinase which catalyses the oxidation of tyrosine by molecular oxygen. Helium produces the least inhibition (16%) among these gases. This small but significant inhibition of an enzyme at pressures within experimental depth ranges projected for future manned diving constitutes a finding of great potential importance to diving physiologists. Studies with the mold Neurospora crassa revealed a striking relationship between the biological effectiveness of helium group gases and their ability to take part in weak intermolecular interactions. The effect of helium group gases under pressures of up to 55.2 atm. on the rate of growth of mammalian cells in culture roughly parallels the effect seen on N. crassa or in the enzyme studies.

AD-615 835 Div. 16/1

California Univ., San Francisco. Medical Center.
LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY,
by H. H. Fudenberg, R. Hong, and A. Nisonoff.
17 Nov 64, 4p
Contract Nonr365612; Grant NIH AT06281
Unclassified report

Pub. in Science v148 n3666 p91-3 Apr 2 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Complement, Antigen-antibody reactions), (*Antigen-antibody reactions, Complement), Serum albumin, Globulins, Proteins, Molecular association.

Hybrid univalent 6.5S antibody molecules, formed by recombination of half-molecules of rabbit antibody to ovalbumin with those of normal rabbit gamma-gamma globulin, fail to fix complement in reactions with homologous antigen. Such hybrid molecules, however, block complement fixation by intact antibody to ovalbumin. Molecules of antibody reconstituted in the absence of other protein retain the

capacity to fix complement. The data suggest that small complexes containing excess univalent antibody do not fix complement and that lattice formation is required for fixation. (Author)

AD-615 836 Div. 16/4

Brooke Army Medical Center, Fort Sam Houston, Tex.
THE OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS,
by E. L. Peyton, John F. Reinert, and Norman E. Peterson. 1964, 10p
Unclassified report

Pub. in Mosquito News v24 n4 p449-58 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Culicidae, United States), (*Texas, Culicidae), Collecting methods, Adults, Larvae, Reproduction(Physiology), Eggs, Life cycle, Bites + stings.

Adults and larvae of Deinocerites pseudes Dyar and Knab were first collected in the United States in November, 1963 approximately 21 miles east of Brownsville (Cameron County), Texas. D. pseudes is commonly found in association with D. mathesoni Belkin and Hogue in crabholes, yet each appears to have a definite preference of size hole; D. pseudes prefers holes of 2 inches or larger in diameter while D. mathesoni prefers holes of 3/4 to 1 and 1/4 inches in diameter. Larvae of D. pseudes were taken from the holes of the land crabs, Uca subcylindrica (Stimpson), Gecarcinus lateralis (Freminville) and Cardisoma guanhumi (Latreille). Larvae of D. mathesoni were taken from the holes of Uca subcylindrica and Gecarcinus lateralis. The complete life cycle for both species appears to be from 2 to 2 1/2 months. The winter is passed in all stages, but a marked reduction in pupae and adults occurs during the colder months. The period of development of the immature stages is prolonged during the winter. Hatching of eggs in the field occurred during late February and early March. Females of D. pseudes will readily feed on man and on occasion can be quite annoying in the immediate breeding area. Adults of both species appear to be nocturnal in habits and each shows a reluctance to fly in daylight. Both species have been collected in light traps. Crabhole traps as described by Evans (1962) proved to be quite useful in studying adult activities and are an excellent tool for the collection of males. (Author)

AD-615 843 Div. 16/11, 16/1, 16/10

Dalhousie Univ., Halifax (Nova Scotia).
EFFECT OF I-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THE VALSALVA MANEUVER,
by A. O'Neill and L. Cudkowicz. 17 Apr 64, 11p
Grant DRB9310 96
Unclassified report

Pub. in American Heart Journal v69 n2 p220-8 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Levarterenol, Blood pressure), (*Cardiovascular diseases, Levarterenol), Heart, Pathology, Cardiovascular agents, Electrocardiography, Pharmacology, Dosage, Drugs, Nova Scotia.

Right atrial pressures were measured in 22 patients before and immediately after the cessation of airway straining. In 9 patients (Group I) who showed a normal response of the peripheral arterial blood pressure to the Valsalva maneuver, the resting mean right atrial pressure of 6.7/2.7 mm. Hg rose to a mean of 12.2/7.6 mm. Hg ($p = < 0.01$) during Phase 4 of the overshoot. Thirteen patients in Group II, including 6 with congestive heart failure, responded with the 'square wave phenomenon' to the Valsalva maneuver. The resting mean right atrial pressure of 16.5/11.6 mm. Hg remained unchanged after cessation of airway straining ($p = > 0.1$) and differed significantly from that of Group I ($p = < 0.01$). Infusion of l-norepinephrine (4 micrograms per minute) into the right atrium of the 9 patients of Group I led to the emergence of the square wave response to the Valsalva maneuver within approximately 10 minutes of the infusion and subsequent to the maximum elevation in peripheral arterial blood pressure. The resting mean right atrial pressure rose significantly from 6.7/2.7 to 15.8/10.3 mm. Hg ($p = 0.01$) and remained unchanged after the Valsalva maneuver, i.e., 15.7/10.1 mm. Hg ($p = > 0.1$). No statistical difference obtained between the resting mean right atrial pressures of patients who showed the square wave response (Group II) and those of the patients who received infusion of l-norepinephrine ($p = > 0.1$), and it is suggested that an elevated central venous and right atrial mean pressure of approximately 13 mm. Hg in the presence of an increment of intrathoracic pressure not exceeding 40 mm. Hg becomes associated with the square wave phenomenon. (Author)

AD-615 851 Div. 16/10, 16/2

Naval Medical Research Unit no. 2 Taipei (Taiwan).
A VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962,
by S. C. Sun, S. M. Chuong, and J. W. Fresh.
30 Jul 64, 6p Research rept. MR005.09-1201.11.2
Proj. MR005 09, Task MR005 09 1201
Unclassified report

Pub. in Archives of Internal Medicine v115 p261-5 Mar 65 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hepatitus viruses, Taiwan), (*Military medicine, Hepatitus viruses), Liver, Infectious diseases, Histological techniques, Morphology(Biology), Military personnel, Medical examination, Diagnosis.

An estimate of the incidence of icteric forms of viral hepatitis (VH) in a confined military district was obtained by reviewing the hospital records. The incidence of the icteric form in this district averages 72.8 per 100,000. A survey performed in this same district among clinically well people to detect VH disclosed an incidence of 2.5%, roughly a ratio of 34:1 for anicteric to icteric forms. The clinical records of jaundiced patients in a large civilian hospital were reviewed and correlated with their needle liver biopsies. These are compared with the military population. The histologic findings are emphasized. A tentative classification of the histological findings into four categories is made. Six patients with follow-up liver biopsies had advanced changes associated with hepatitis. (Author)

AD-615 873 Div. 16/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
USING THE METHOD OF FLUORESCENT ANTIBODIES TO INVESTIGATE THE ANTIGEN-ANTIBODY REACTION IN TISSUES: STUDYING THE LOCALIZATION OF ANTINEPHRITIC AND ANTIHEPATIC ANTIBODIES IN HOMO- AND HETEROLOGOUS TISSUES,
by I. I. Kolker. 1965, 14p FTD-TT-65-464
TT 65-62399
Unclassified report

Unedited rough draft trans. of Eksperimentalnaya Khirurgiya i Anesteziologiya (USSR) v8 n2 p57-64 1963.

Descriptors: (*Antigens + antibodies, Kidneys), (*Antigen-antibody reactions, Tracer studies), Tissues(Biology), Fluorescence, Blood vessels, Liver, Immunology, Immune serums, Histological techniques, USSR.

Conclusions: (1) Antinephritic antibodies reveal a selective localization in a homologous organ and are found in lesser amounts in heterologous organs. (2) Maximum localization of antinephritic antibodies is noticed in nephritic balls, especially in capillary clusters of balls. (3) In heterologous organs antibodies are most frequently localized in points where blood bearing vessel and capillaries are situated. (4) Antihepatic antibodies do not reveal such a selective localization, they are distributed more or less uniformly over all organs. (Author)

AD-615 890 Div. 29/2
CFSTI Prices: HC$2.00 MF$0.50

Northwestern Univ., Evanston, Ill. Technological Inst.
INVESTIGATION INTO THE MECHANISM OF FREEZE DRYING.
Final technical rept. for 29 Sep 59-28 Dec 61,
by J. Edward Sunderland. 28 Feb 62, 46p
Contract DA19 129QM1487, Proj. 7 84 06 032
Unclassified report

Descriptors: (*Beef, Freeze drying), (*Freeze drying, Beef), Thermal conductivity, Emissivity, Fats, Measurement, Temperature, Heat transfer, Low-temperature research, Blackbody radiation, Instrumentation, Calibration, Theory.

Final results are given of measurements of the emissivity and thermal conductivity of beef and studies are given concerning the mechanism of freeze drying. (Author)

AD-615 916 Div. 16/8, 16/1, 30/5
CFSTI Prices: HC$2.00 MF$0.50

Benson (Robert W.) and Associates, Inc., Nashville, Tenn.
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
Final rept. for Jun 63-Aug 64,
by Robert W. Benson. Apr 65, 29p
Contract AF33 657 11335, Proj. 7231, Task 723103
AMRL TR-65-11 Unclassified report

Descriptors: (*Hearing, Medical research), (*Vibration, Hearing), (*Vibrators(Electrical), Medical research), Bone, Tissues(Biology), Laboratory equipment, Acoustic impedance, Audiofrequency, Thresholds-(Physiology), Auditory perception, Biophysics, Sound transmission, Sensory mechanisms, Design, Calibration.

A special purpose laboratory vibrator has been developed for use in experimental investigations of hearing by bone and tissue conduction and of mechanical driving point impedance of tissue and bone. The vibrator assembly is floated on an air bearing to provide resonance-free operation over the frequency range of 100 - 10,000 cps and at intensity levels of 60 decibels above threshold of hearing. Special sensors within the unit provide measurement of the tip velocity of the alternating pressure transmitted by the head and the force due to an external load. Design features and calibration procedures are discussed in this report. (Author)

AD-615 929 Div. 16/15, 28/3
CFSTI Prices: HC$1.00 MF$0.50

Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
EFFECT OF AUGMENTED TELEVISION DEPTH CUES ON THE TERMINAL PHASE OF REMOTE DRIVING.
Final rept. for Jan-Apr 64,
by William N. Kama. Apr 65, 13p
AMRL TR-65-6
Proj. 8171, Task 817105
Unclassified report

Descriptors: (*Television guidance, Positioning reactions), (*Positioning reactions, Television guidance), Television display systems, Remote control systems, Space perception, Vision, Errors, Human engineering.

The ability of eight untrained subjects to position a mobile remote handling unit in the fore and aft dimension was assessed under each of four different viewing conditions. The viewing conditions investigated were: (a) direct viewing, (b) conventional 2-dimensional (2-D) closed-circuit television, (c) 2-D closed-circuit television augmented by shadows at the target, and (d) 2-D closed-circuit television augmented by converging light beams moving with the mobile unit. The results indicate that the augmented television conditions (c and d) facilitated successful positioning of the mobile unit. Under the augmented television conditions (c and d) there was a tendency to overshoot the target slightly. However, the amount and variability of the positioning errors were less under the augmented television conditions than under either the direct viewing condition or the conventional, unaugmented, television condition. The converging light system merits further investigation as a method of providing range information. (Author)

AD-615 934 Div. 16/15, 28/3
CFSTI Prices: HC$3.00 MF$0.75

Human Engineering Labs., Aberdeen Proving Ground, Md.
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER-RIFLES,
by Georges R. Garinther and Karl D. Kryter.
Jan 65, 64p Technical memo. no. TM-1-65
Unclassified report

Descriptors: (*Hearing, Thresholds(Physiology)), (*Audiometry, Army personnel), (*Small arms, Noise), Acoustics, Sound, Military medicine, Tests.

The threshold of audibility of each ear of 178 soldiers was measured before and after firing various types of shoulder rifles at the rate of one trigger pull every five seconds. The acoustical impulses from each type of weapon were evaluated (peak pressure, time history, and spectrum). The peak pressures of the acoustic impulse from firing the weapons were highly correlated with threshold shifts caused by exposure to the gun noise From these and related data, estimates are made of the expected permanent hearing level in the frequency region from 1000 cps to 6000 cps to be equalled or exceeded in 50, 25, and 10 percent of ears repeatedly exposed to gun noise at various peak sound-pressure levels. (Author)

AD-615 967 Div. 16/1, 16/11
CFSTI Prices: HC$5.00 MF$1.00

California Univ., Berkeley.
THE CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
Final rept. for 1953-1956,
by Erwin R. Archibald. Dec 64, 168p
Proj. 7164, Task 716404
AMRL TR-64-145
Unclassified report

Doctoral thesis.

Descriptors: (*Carbon dioxide, Respiration), (*Respiration, Carbon dioxide), High altitude, Dogs.

Training, Hypnotics + sedatives, Scopolamine, Barbiturates, Hypoxia, Thresholds(Physiology), Adaptation(Physiology), Statistical analysis, Least squares method.

Carbon dioxide response curves were measured in three trained dogs before, during, and after an 18-day sojourn at 12,470 ft altitude. The effects of sedation on CO2 sensitivity were studied in two dogs, using scopolamine and scopolaminethiopental. In addition, tests were made for the presence of an hypoxic drive component in resting ventilation at altitude by measuring the effect on ventilation of a sudden change in alveolar O2 tension from 55 mm Hg to 110 mm Hg. Reductions occurred in resting alveolar O2 and CO2 tensions to 53 and 71% of sea level control, respectively. On the average, CO2 sensitivity was increased during the first 10 days to 160% of sea level control. The CO2 response curve was shifted horizontally to the left by about 8 mm Hg. This decrease in CO2 threshold was statistically significant (P <0.01). Sedation increased the variability of the results. However, there was some evidence that CO2 sensitivity was reduced by sedation. These effects were more pronounced at altitude than at sea level. Tests for an hypoxic drive component showed a transitory reduction in alveolar ventilation occurring 1 minute after the increase in alveolar O2 tension. In subjects under sedation with scopolaminethiopental, 40% of resting ventilation was attributable to peripheral chemoreflexes. (Author)

AD-615 979 Div. 16/6, 13/3, 12/1
CFSTI Prices: HC$2.00 MF$0.50

Whirlpool Corp., St. Joseph, Mich. Research and Engineering Labs.
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
Final rept. for May 63-Oct 64,
by Duane C. Nichols. Mar 65, 27p
Contract AF33 657 11479, Proj. 6373, Task 637304
AMRL TR-65-29
Unclassified report

Descriptors: (*Distillation, Urine), (*Urine, Purification), (*Life support, Water), Aerospace craft, Manned spacecraft, Astronauts, Closed ecological systems, Thermoelectricity, Filters(Fluid), Charcoal, Distillation, Feasibility studies, Processing, Adsorption.

The project was inititated to design, fabricate, and test a thermoelectric system for the recovery of potable water from urine in aerospace applications. The unit built is an integral system, which yields quality potable water at a performance factor of 146 watt-hours per pound. It has a capacity of processing 12 liters of urine per day with a batch size of 1 liter per run. Further development work should be undertaken toward obtaining better efficiencies, a decrease in size, and a reduction in weight. (Author)

AD-615 995 Div. 15/12, 28/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CHANGES IN THE ELECTROENCEPHALOGRAM AND DERMA-GALVANIC REACTIONS IN THE PROCESS OF FORMATION OF TENTATIVE RELATIONSHIP BETWEEN MOTORIAL AND VISUAL ANALYZERS IN HUMANS,
by V. M. Vasileva. 3 Jun 65, 16p FTD-TT-65-434
TT 65-62421
Unclassified report

Unedited rough draft trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v14 n5 p755-62 1964.

Descriptors: (*Electroencephalography, Conditioned reflex), (*Galvanic skin response, Conditioned reflex), Neurology, Brain, Nerves, Muscles, Motor reactions, Vision, Neuromuscular transmission, End organs, Proprioception, Stimulation, Thresholds(Physiology), Psychophysiology.

A pairing was made of the kinesthesic and photic stimulations in man with a view to forming a temporary connection between the motor and visual analysers. Proprioceptive stimulation was achieved by the movement of the muscles, provoked by stimulation of the ulnar nerve through the skin by threshold impulses of a rectangular current not accompanied by tactile effect. After several pairings of the stimuli a conditioned EEG response was elaborated: the movements of the muscles resulted in the same depression of the alpha-rhythm in the occipital area as the photic stimulations paired with them. The dynamics of EEG and SGR changes in the course of formation of such a reaction is characterized by a number of regularities inherent in temporary connections between exteroceptive stimuli. (Author)

AD-616 003 Div. 16/4
CFSTI Prices: HC$1.00 MF$0.50

Maryland Univ., College Park.
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6,
ed. by George Anastos. 1965, 18p
Contract DA49 193MD2238
TT 65-62422
Unclassified report

See also AD-613 668.

Descriptors: (*Insects, Bibliographies), (*Bibliographies, Insects), (*Disease vectors, Bibliographies), Ticks, Mites, Diptera, Siphonaptera, Lice, Rickettsia, Bacteria, Spirochaeta, Protozoa, Parasites, Viruses, Worms, Immunity, Pest control, Insecticides, Ecology, Epidemiology, USSR, Eastern Europe, China.

AD-616 011 Div. 4/3, 4/4, 16/3, 25/7

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
RELAXATION SPECTRA OF RIBONUCLEASE,
by Renata E. Cathou and Gordon G. Hammes.
1964, 2p Unclassified report

Research supported by U. S. Army Signal Corps, Air Force Office of Scientific Research, Office of Naval Research, and National Institutes of Health.
Pub. in Berichte der Bunsengesellschaft fuer Physikalisc Chemie v68 n8/9 p759-60 1964 (Copies available only to DDC users).

Descriptors: (*Ribonuclease, Molecular spectroscopy), (*Relaxation time, Ribonuclease), Enzymes, Catalysts, Hydrolysis, Reaction kinetics.

AD-616 014 Div. 16/2

Naval Medical Research Unit No. 2, Taipei (Taiwan).
REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964,
by Charles Neave and Robert L. Woolridge.
17 Jul 64, 8p Rept. no. MR005.09-1201.12.28
Proj. MR005 09, Task MR005 09 1201
Unclassified report

Pub. in Formosan Medical Association. Journal

v64 n1 p1-6 Jan 28 1965 (Copies available only to DDC users).

Descriptors: (*Chlamydia trachomatis, Vaccines), (*Vaccines, Antigen-antibody reactions), Viruses, Immunology, Injection(Medicine), Embryonated egg technique, Medical research, Pain, Lipids, Adults, Males, Children, Taiwan.

Data based on physical examination of primary school children who received intramuscular and booster injections of monovalent or bivalent trachoma oil-adjuvant vaccine are presented. No adverse reactions due to vaccines followed the primary shot. One adult male (of 44 injected) developed a lipid granuloma beneath the site of the booster injection of monovalent vaccine. Among the school children, 4.2% of those vaccinated with booster injection of monovalent and 0.96% with bivalent trachoma virus vaccine developed a syndrome consisting of pain in the inoculated arm and/or fever and/or tenderness at the site of injection. This syndrome lasted less than 48 hours and was not debilitating. No residual reactions have been found in these children after 17 months' follow-up. (Author)

AD-616 024 Div. 16/10

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTERATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
by Robert E. Stowell, Douglas E. Young, Eugene A. Arnold, and Benjamin F. Trump. 1964, 27p
Unclassified report

Pub. in Federation Proceedings v24 n2 pt3 pS115-41 Mar-Apr 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Freezing, Tissues(Biology), (*Nuclei(Biology), Freezing), Mammals, Cells(Biology), Preservation, Viability, Ice, Enzymes, Synthesis, Desoxyribonucleic acids, Amino acids, Proteins, Pathology.

The best structural preservation of nuclei of frozen mammalian tissue appears to be attained with the most rapid possible cooling from O C to below approximately -100 C. Conditions of slow freezing, which are better in general for preservation of chemical constituents and viability of cells, lead to large, intranuclear ice crystal formation during the frozen state with marked displacement of the nucleoplasm, including chromatin and nucleoli. Under conditions of rapid thawing there is an amazine structural reconstitution of the nucleus so that in some tissues which are rapidly thawed it is difficult to recognize any changes other than slight clumping of chromatin. Such thawed nuclei are frequently shrunken and have an increased affinity for certain basic dyes. If the nuclei are thawed slowly, there may be large residual areas of displaced nucleoplasm evident. There are also important structural changes in the nuclear envelope, most frequently noted by focal or general separation of the inner and outer nuclear membranes. The physicochemical changes occurring in association with freezing are caused by formation of ice crystals and the resulting concentration of the solute in the nucleoplasm. Some nuclear enzymes, for example NAD-pyrophosphorylase, are not appreciably affected by freezing. Although the total amount of DNA is not altered by freezing, a reduced synthesis of DNA as measured by tritated thymidine uptake does occur. (Author)

AD-616 025 Div. 16/3, 16/10

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS,
by Wallace A. Jones, Elson B. Helwig, and Louis E. Harmon. 22 Apr 64, 8p
Unclassified report

Pub. in The Journal of Investigative Dermatology v44 n3 p189-95 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Integumentary diseases, Enzymes), (*Enzymes, Integumentary diseases), (*Skin, Enzymes), Diseases, Pathology, Histological techniques, Oxidoreductases, Saccharide phosphates.

Alterations of oxidative enzyme activity were found in psoriatic lesions from 10 patients with psoriasis. The changes were characterized by intense glucose-6-phosphate dehydrogenase and TPNH-diaphorase activity in the more superficial layers of the epidermis and in parakeratotic scales. In the deeper layers of the epidermis, increased activity of the latter 3 enzymes was found, with the greatest increase occurring in the depths of acanthotic zones. Healing of the lesions was marked by a return to the normal pattern of enzyme activity, although anatomic changes persisted. (Author)

AD-616 026 Div. 16/10, 16/1

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOPOIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST,
by Robert J. Hartsock, Edward B. Smith, and Charles S. Petty. 17 Dec 64, 7p
Unclassified report

Pub. in The American Journal of Clinical Pathology v43 n4 p326-31 1965.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hemopoietic system, Aging(Physiology)), (*Aging(Physiology), Hemopoietic system), Bone marrow, Tissue extracts, Bone, Pathology, Graphics.

The normal variations with aging of hematopoietic tissue of the anterior iliac crest were determined in a series of 177 persons by means of the point-counting method of Chalkley. The series was carefully selected from 287 instances of sudden death examined by necropsy. The graph constructed from the values of the mean percentages of hematopoietic tissue in each decade could be divided arbitrarily into 3 distinct phases. The amount of hematopoietic tissue of the first decade was 79 per cent; this diminished to about 50 per cent at the age of 30 and remained relatively constant until age 70. During the eighth decade a second appreciable decline in the amount of hematopoietic tissue occurred. When the graph of the relative amount of hematopoietic tissue of the iliac crest was compared with graphs published by Custer and Ahlfeldt, the amount of hematopoietic tissue of the anterior iliac crest was greater than the hematopoietic tissue of the rib and less than the hematopoietic tissue of the sternum. (Author)

AD-616 027 Div. 16/10

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
HEMANGIOSARCOMA OF THE BREAST,
by Laszlo C. Steingaszner, Franz M. Enzinger, and Herbert B. Taylor. 27 Jul 64, 10p
Unclassified report

Pub. in CANCER v18 n3 p352-61 Mar 1965.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cancer, Mammary glands), (*Mammary glands, Cancer), Pathology, Histological techniques, Diagnosis, Surgery, Excision, Therapy, Cells(Biology), Mitosis.

The clinical and pathologic findings in a series of 10 examples of hemangiosarcoma of the breast are presented and compared with those of previously reported cases. On the 10 patients 2 are living and well 7 and 14 years post-operatively and are the first reported examples of probable cures. Both of these patients had small lesions of short known duration in contrast to the usual finding of large bulky tumors. The histologic criteria for diagnosis are described. If a frankly malignant histologic picture is not evident, distinction from benign hemangiomas may be made on the basis of finding atypical endothelial cells lining inter-communicating vascular spaces and the presence of intraluminal endothelial proliferation. A fair correlation between the degree of mitotic activity and behavior of the tumor was found although the varied histologic appearance made it difficult to predict the clinical course on purely morphologic grounds. The presence of extensive areas of hematopoiesis within metastatic tumor nodules in the ovaries, lungs, liver and spleen is described. No hematopoietic foci were found in the primary tumor despite careful search. On the basis of the available data simple mastectomy is favored as the treatment of choice. While radiation occasionally has been described as being of palliative value, there is no evidence that it has a significant effect on the ultimate outcome. (Author)

AD-616 029 Div. 16/10

Temple Univ., Philadelphia, Pa.
CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY,
by Waine C. Johnson, James H. Graham, and Elson B. Helwig. 1964, 6p
Grant PHS 2A5289C2
Unclassified report

Rept. presented to the Section on Dermatology at the annual convention of the American Medical Association (113th), San Francisco, Calif., 24 Jun 64.
Pub. in Journal of the American Medical Association v191 p15-20 Jan 4 1965 (Copies not available to DDC or Clearinghouse customers.
Reprints available from Dr. Johnson, 804 Pine St., Philadelphia, Pa. 10107.

Descriptors: (*Integumentary diseases, Therapy), (*Histological techniques, Integumentary diseases), Hands, Feet, Nails(Tissues), Surgery, Excision, Injection(Medicine), Corticosteroid agents, Pathology, Etiology.

Analysis of 43 cutaneous myxoid cysts in 40 patients with lesions of the fingers and toes revealed the most common clinical appearance to be a soft or fluctuant cystic nodule. The pathogenesis consists of fibroblastic proliferation in the corium, an increased production of hyaluronic acid by these fibroblasts, and an associated decrease or absence of collagen formation. Hyaluronic acid accumulates between the collagen fibers, eventually replaces the collagen, and usually results in formation of cystic spaces in the corium. No evidence was found to support origin from joint cavities, tendon sheaths, or bursae. Local surgical excision and other destructive methods resulted in a fairly high rate of recurrence. Injection of triamcinolone into the lesion is a simple and effective method of treatment. (Author)

AD-616 030 Div. 16/5

School of Aerospace Medicine, Brooks AFB, Tex.
REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE,
by I. L. Shannon, W. A. Gibson, and H. H. Chauncey. 1964, 6p
Unclassified report

Research done in cooperation with Tufts Univ. School of Dental Medicine, Boston, Mass.
Pub. in Journal of the Canadian Dental Association v30 p646-51 Oct 1964 (Copies available only to DDC users).

Descriptors: (*Dentistry, Saliva), (*Saliva, Dentistry), Teeth, Diseases, Organic nitrogen compounds, Resorcinol, Tests, Males.

Whole saliva reducing determinations were carried out on 402 systemically healthy young adult males. A diazo-resorcinol test was employed in these measurements. Results were compared to DMFS scores and the number of carious surfaces present. There was a trend of higher DMFS scores and more carious surfaces, but the test was not of diagnostic value for individual subjects. (Author)

AD-616 066 Div. 30/5

Massachusetts Inst. of Tech., Cambridge.
NORBERT WIENER, 1894-1964.
1964, 17p
Unclassified report

Pub. in Journal of Nervous and Mental Disease. v140 n1 p3-16 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cybernetics, Scientific personnel).

Contents: From Philosophy to Mathematics to Biology: The Life Sciences and Cybernetics, by Walter A. Rosenblith and Jerome B. Wiesner; Norbert Wiener as the Prophet of the Cybernetic Revolution, by Anatol Rapoport; Norbert Wiener--'Catalytic Irritant', by D. M. MacKay; Norbert Wiener, Cybernetics and Homeostasis, by Hudson Hoagland; Norbert Wiener and the Renaissance of Neurophysiology, by W. Ross Adey; Norbert Wiener and the Maturation of Psychology, by Wendell R. Garner; Norbert Wiener and Psychiatry, by Stanley Cobb; Norbert Wiener and the Art of Theory, by Warren S. McCulloch.

AD-616 069 Div. 16/3

Tufts Univ., Boston, Mass. School of Medicine.
LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE,
by Bronius Baskys, Edmund Klein, and Walter F. Lever. 30 Jan 63, 9p
Contract DA49 193MD2082; Grant NIH A4486
Unclassified report

Pub. in Archives of Biochemistry and Biophysics v102 n2 p201-9 Aug 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Enzymes, Purification), (*Pancreas, Enzymes), Chromatographic analysis, Electrophoresis, Ph, Swine.

Porcine pancreatic lipase was purified 315-fold. The purified pancreatic lipase was homogeneous on ultracentrifugation and free-boundary electrophoresis. On starch-gel electrophoresis and DEAE chromatography, however, at least two components were present. The optimal pH for purified pancreatic lipase was 8.0-8.1. The eluates obtained after DEAE-cellulose column chromatography of purified pancreatic lipase were completely inactive. Addition of a heat-stable factor

derived from pancreatic lipase to the inactive eluates restored the specific lipase activity to about 90% of its original value before DEAE chromatography. (Author)

AD-616 072 Div. 16/4

Walter Reed Army Inst. of Research, Washington, D. C.
STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER,
by L. C. Rutledge, R. A. Ward, and D. J. Gould.
1964, 13p
Unclassified report

Pub. in Mosquito News v24 n4 p407-19 Dec 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Culicidae, Food), Nutrition, Membranes, Laboratory equipment, Aging(Physiology), Eggs.

A new device for feeding mosquitoes is described. The feeder is made of heat-resistant glass or stainless steel to permit autoclaving. It is small and of single-piece construction for case of handling; it can be used with any source of circulating warm water for temperature control and with any mosquito cage that has a screened horizontal top. The usefulness of the new device is demonstrated by reports of some experiments relating to the effects of several factors on proportion of mosquitoes feeding. Among the factors investigated were type of food, type of membrane, phagostimulants, species characteristics, species mixtures, crowding, and age. A note on egg production and destination of meal in artifically fed mosquitoes is included. (Author)

AD-616 073 Div. 16/3

Walter Reed Army Inst. of Research, Washington, D. C.
THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE-RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
by Yaye F. Herman, Craig J. Canfield, Marcel E. Conrad, and Robert H. Herman. 25 Aug 64, 4p
Unclassified report

Pub. in Metabolism v14 n4 p500-3 Apr 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Erythrocytes, Glucose), (*Glucose, Metabolism), Blood chemistry, Saccharide phosphates, Carboxylic acids.

The production of C(14)O2 from 1-C(14) and 6-C(14)-glucose by intact reticulocyterich and reticulocyte-poor human red blood cells was measured. The data are consistent with the hypothesis that reticulocytes contain an operative pentose phosphate pathway but not a functioning Kreb's tricarboxylic acid cycle. (Author)

AD-616 081 Div. 16/3

Columbia Univ., New York. Coll. of Physicians and Surgeons.
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
by Bernard F. Erlanger, William Cohen, Spyros M. Vratsanos, Harriet Castleman, and A. G. Cooper. 1964, 10p
Contract Nonr26673; Grant NSF GB579
Unclassified report

Pub. in Nature v205 n4974 p868-71 Feb 27 1965
(Copies available only to DDC users).

Descriptors: (*Chymotrypsin, Biochemistry), (*Trypsin, Biochemistry), Enzymes, Organic phosphorus compounds, Molecular structure, Amines, Hydrolysis, Ph.

The following differences between chymotrypsin and trypsin have been found: (a) Hydroxylamine can completely reactivate DEP-trypsin but not DEP-chymotrypsin. Reaction with the latter leads to the formation of some MEP-chymotrypsin which cannot be converted to active enzyme; (b) MEP-trypsin apparently can result from the reaction of DEP-trypsin with hydroxylamine only if ethylamine or cyclopropylamine is present; (c) ethylamine and cyclopropylamine can accelerate the tryptic hydrolysis of AGEE but have no effect on its chymotryptic hydrolysis; (d) the tryptic hydrolysis of specific substrates is subject to substrate activation. The hydrolysis of specific substrates by chymotrypsin is not activated by substrates, nor is it affected by ethyl or cyclopropylamine; (e) the curve relating pH to the rate of reaction of alpha-chymotrypsin with diphenylcarbamyl chloride has a maximum at pH 7.8. That of trypsin with diphenylcarbamyl chloride is essentially 'S'-shaped up to pH 9.0-9.5. The foregoing findings agree with the hypothesis that chymotrypsin has an additional general acid at its active centre. (Author)

AD-616 085 Div. 16/1

New York Medical Coll., N. Y.
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,
by E. L. House, B. Pansky, M. S. Jacobs, J. Palmer, and V. Ostrower. 1962, 5p
Contract Nonr275401
Unclassified report

Pub. in Annals of the New York Academy of Sciences, v120 article p652-5 Nov 30 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Pancreas, Transplantation), (*Transplantation, Immunity), Thymus, Excision, Histology, Tissues(Biology), Hamsters, Mice, Aging(Physiology).

The results of the study appear to partially substantiate Miller's conclusions concerning the role of the thymus in transplantation immunity. However, the study also points out a difference between the mouse and hamster in regard to their response to tissue grafts and to the age-function relationship of the thymus, for Miller has indicated that the optimum effects were obtained when thymectomy was performed on the newborn. If the mice were more than two weeks old, thymectomy was ineffective in changing the reaction to transplanted tissue. At present, no attempt will be made to explain the apparent increase in islet differentiation. This phase is now under investigation. (Author)

AD-616 134 Div. 16/13, 16/1

Walter Reed Army Inst. of Research, Washington, D. C.
THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION,
by Martin L. Dalton, Jr., Everett C. Mosley, Kenneth E. Woodward, and Timothy G. Barila. 4 Nov 64, 5p
Unclassified report

Pub. in The Journal of Surgical Research v5 n3 p127-31 Mar 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Heart, Mechanical organs), (*Mechanical organs, Blood circulation), (*Surgical techniques,

Mechanical organs), Kidneys, Pulse rate, Tissues-(Biology), Histology, Pathology, Dogs.

The studies indicate that definitive laboratory and specific renal blood flow measurements do not show any marked differences between dogs perfused on total bypass with the roller pump and those perfused in the same system, at the same flow rate, with the Army Artificial Heart Pump. Nevertheless, the pathologic changes definitely indicate that pulsatile flow is much less damaging to the renal architecture than in nonpulsatile flow. This would seem to have a profound effect upon ultimate renal function. (Author)

AD-616 135 Div. 16/2

Walter Reed Army Inst. of Research, Washington, D. C.
BORRELIAE, HUMAN RELAPSING FEVER, AND PARASITE-VECTOR-HOST RELATIONSHIPS,
by Oscar Felsenfeld. 1963, 29p
Unclassified report

Pub. in Bacteriological Reviews v29 n1 p46-74 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Borrelia, Diseases), (*Disease vectors, Borrelia), Parasites, Morphology(Biology), Embryonated egg technique, Insects, Pathology, Biochemistry, Laboratory animals, Lice, Ticks, Immunity, Antigens and antibodies, Vaccines, Epidemiology, Classification, Preservation, Borrelia recurrentis.

The paper reviews critically current information on borreliae, their relationship to insect vectors, the pathology of experimental infection, and the immunology and laboratory diagnosis of human relapsing fever.

AD-616 136 Div. 16/2

Walter Reed Army Inst. of Research, Washington, D. C.
SURVIVAL OF SHIGELLA AND SALMOMELLA IN A NEW TRANSPORT MEDIUM,
by Sylvia G. Cary, Matthew H. Frusillo, and Charles Harkins. 25 Aug 64, 3p
Unclassified report

Pub. in The Americal Journal of Clinical Pathology v43 n3 1965 and Technical Bulletin of the Registry of Medical Technologists v35 n2 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Enterobacteriaceae, Culture media), (*Shigella, Culture media), (*Salmonella, Culture media), Preservation, Contamination, Viability.

In a survey of 162 routine fecal specimens, collected in a new transport medium, strains of Shigella were recoverable for as long as 49 days at room temperature. Salmonella continued to be isolated in spite of the presence of Proteus and Pseudomonas aeruginosa for at least 45 days. In other specimens, not containing these contaminants, Salmonella were isolated for as long as 62 days. Shigella sonnei I was recovered for up to 34 days from a portion of bowel placed in the transport medium. (Author)

AD-616 137 Div. 16/11, 16/1

Walter Reed Army Inst. of Research, Washington, D. C.
PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN,
by Leroy Shear, James H. Shinaberger, and Kevin G. Barry. 1964, 4p Unclassified report

Pub. in New England Journal of Medicine v272 p666-9 Apr 1 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Peritoneum, Antibiotics), (*Antibiotics, Peritoneum), (*Parenteral infusions, Antibiotics), Drugs, Tetracyclines, Absorption(Biological), Cannulation, Diffusion, Membranes(Biology), Therapy.

Rate of diffusion of methicillin and tetracycline across the peritoneal membrane was studied in adult human subjects without peritonitis. Antibiotic concentrations within the therapeutic range were attained in both serum and peritoneal fluid after either intramuscular or intraperitoneal administration. Equilibration between serum and peritoneal fluid was not complete, however. Therefore, the amount of antibiotic extracted during peritoneal dialysis in patients receiving intramuscular therapy was too small to necessitate increasing the dose used to treat systemic infection. Antibiotic concentrations in peritoneal fluid were low after systemic administration in patients undergoing peritoneal dialysis. Therefore, it is suggested that treatment of peritonitis in patients who are being dialyzed should include intraperitoneally administered antibiotic. (Author)

AD-616 138 Div. 16/3

Walter Reed Army Inst. of Research, Washington, D. C.
POLAROGRAPHIC DETERMINATION OF TRACES OF GOLD IN BLOOD AND SERUM,
by Gary D. Christian. 23 Jul 64, 6p
Unclassified report

Pub. in Clinical Chemistry v11 n4 p459-64 Apr 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gold, Polarographic analysis), (*Blood chemistry, Gold), Gold compounds, Blood, Blood serum, Sodium compounds, Drugs, Test methods.

A polarographic method for the determination of as little as 1 microgram of gold in blood and serum samples is described. The relative error is 2.1%. After the sample is dry ashed at 550 degrees, the gold is extracted into ether as the chloride, to separate it from interfering copper and iron. A polarogram of the gold sample is obtained in 2 M potassium hydroxide. The method should be applicable to the determination of gold in other biological samples containing interfering elements. (Author)

AD-616 139 Div. 16/1

Walter Reed Army Inst. of Research, Washington, D. C.
A KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE,
by Jean-Rene DuPont, Helen R. Jervis, and Helmuth Sprinz. 1965, 5p
Unclassified report

Pub. in The American Journal of Anatomy v116 n1 p335-9 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nerve cells, Intestines), (*Body weight, Nerve cells), Anatomy, Ganglia, Autonomic nervous system, Rats.

The relationship between organ size, body weight and the size variations in myenteric neurones of the ileum and cecum was studied in white Fisher rats. Three groups of conventional as well as germfree rats of varying body weight were utilized. Myenteric neurones in the cecum and ileum 'grow' with increasing

body weight. Cecal neurones have a steeper growth curve than ileal neurones. The average diameter of Auerbach's ganglion cells in the cecum is 13.6 microns in 90 gm rats, 20.0 in 300 gm rats. In medium sized rats (150 gm) the myenteric neurones of the germfree cecum are 2-3 times as large as those in the cecum of conventional animals. This increase is proportional to the enlarged cecal circumference in germfree rodents. When small (90 gm) germfree rats are conventionalized the myenteric neurones return to normal size as the cecum 'shrinks' to normal size. In the intramural parasympathetic nervous system of the gut organ size as well as body weight are determinants of ganglion cell size. (Author)

AD-616 152 Div. 16/12, 28/5

Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
THE OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE,
by Ransom J. Arthur, Helen T. Cupper, and Ivan G. Gendzel. 1964, 4p
Unclassified report

Pub. in Military Medicine v129 n12 p1177-80 Dec 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Psychoses, Naval personnel), (*Naval personnel, Psychoses), (*Psychiatry, Naval personnel), Military psychology, Abnormal psychology, Therapy, Mental disorders, Pehnothiazines, Dosage, Diagnosis, Personality, Hospitals.

One hundred and forty of what were adjudged to be severe and unequivocal schizophrenics were treated at the U.S. Naval Hospital, Oakland, California in the year 1961. Most of the cases had been transferred from other naval installations for further treatment. The cases, which were predominantly young men (in keeping with the age composition of the entire Navy) with acute mixed or paranoid schizophrenia were all treated with phenothiazine drugs in ample dosage, group psychotherapy, individual therapy, occupational, work, and recreational therapy. A follow up one year later indicated that 133 (95 per cent) had been released either from the naval or a veterans hospital to civil life. Of this number 14 or approximately ten per cent had had to be re-hospitalized. These 14 plus seven (21 or 15 per cent) who had never been released were hospitalized on the admission anniversary date. There was complete agreement between the naval and veterans hospitals as to major diagnostic category. The unresponsive patients differed from those with the better prognosis in that the former were younger, were more often high school graduates and more often came from intact homes. The bad prognosis group were characteristically single and had been premorbid schizoid personalities. Their clinical course was marked by a vague onset, ideas of reference, and gross psychosexual confusion. The prognosis for the remission of the youthful naval schizophrenic today is very good, indeed, but some therapeutic failures and relapses must still be expected in spite of vigorous treatment efforts. (Author)

AD-616 155 Div. 16/15

Naval Hospital, Philadelphia, Pa.
FEMORAL HERNIA IN CHILDREN,
by R. G. Fosburg and H. P. Mahin. 1963, 6p
Unclassified report

Pub. in American Journal of Surgery v109 n4 p470-5 1965(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Surgery, Children), (*Abdomen, Rupture), Medicine, Pathology, Etiology, Surgical techniques, Ligaments, Tendons.

Femoral hernia in children is infrequently encountered and represents less than 1 per cent of all hernias in children, consequently no one surgeon has enjoyed any extensive experience in the operative management of this defect. A historical review of femoral hernioplasty in children has failed to produce a unanimity of opinion as to the preferred type of repair in children. A survey of several general and pediatric surgeons revealed a preference for a repair that incorporated Cooper's ligament with either the transversalis fascia, conjoined tendon, or inguinal ligament in children. The majority of respondents and the weight of opinion expressed in the literature favors the concepts of McVay that the etiology of femoral hernia is a congenitally narrow posterior insertion of the inguinal wall onto Cooper's ligament. Additional factors as yet undetermined are also considered to be operative in the development of femoral hernia. The authors conclude that a femoral hernia occurring in children should be repaired by a suprainguinal approach and that the repair should utilize Cooper's ligament. (Author)

AD-616 158 Div. 16/3

School of Aerospace Medicine, Brooks AFB, Tex.
THE EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMINES AS INFLUENCED BY PARGYLINE HYDROCHLORIDE AND IPRONIAZID PHOSPHATE,
by A. A. Wykes and J. H. Landez. 1965, 1p
Unclassified report

Pub. in Federation Proceedings v24 n2 np Mar-Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Central nervous system, Borohydrides), (*Borohydrides, Central nervous system), Decaboranes, Pentaboranes, Heart, Nerves, Brain, Amines, Levarterenol, Serotonin, Dosage, Phosphates, Rats.

Adverse cardiac and neurological symptoms are produced in animals following doses of decaborane ($B_{10}H_{14}$) and pentaborane (B_5H_9). Merritt, Schultz and Wykes have reported sedation in rats and a 63% decrease in brain norepinephrine 24 hrs. after 15 mg/Kg I.P. of decaborane (Biochem. Pharmacol .13 1364(1964)). Data obtained with the Mead and Finger assay for serotonin and norepinephrine (Biochem. Pharmacol .6 52(1961)) indicate serotonin in adult rat brains is increased slightly at 4, 6, 8 and 12 hrs. when norepinephrine is markedly lowered after 20 mg/Kg I.P. of decaborane (Mann). At 16 hrs. serotonin is increased 45%. A dose of 2.5 mg/Kg I.P. of liquid pentaborane-9 lowers norepinephrine nearly 100% at 2 hrs., elevating serotonin 80%. Sedation and decreases in brain norepinephrine at 16 and 24 hrs. after decaborane can be prevented by simultaneous or prior administration of 50 mg/Kg I.P. of pargyline hydrochloride (N-methyl-N-benzyl-2-propynylamine hydrochloride). Similar treatments with 100 mg/Kg I.P. of iproniazid phosphate do not block the fall in tissue norepinephrine due to decaborane (Pvt. note, J. H. Merritt). Our data contribute to an elucidation of the action of boron hydrides in the C.N.S. (Author) (Document quoted in entirety).

AD-616 159 Div. 16/3

School of Aerospace Medicine, Brooks AFB, Tex.
BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS,
by D. L. Trout. 1965, 1p Unclassified report

Pub. in Federation Proceedings v24 n2 np Mar-Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrazine, Lipids), (*Lipids, Hydrazine), (*Glucose, Blood chemistry), (*Blood chemistry, Hydrazine), Blood, Blood plasma, Fats, Fatty acids, Liver, Carbohydrates, Hypoglycemia, Hyperglycemia, Starches, Dosage.

In 48-hour fasted rats, hydrazine (Hy) depressed blood glucose, elevated plasma free fatty acids (FFA), and caused fat accumulation in the liver. The present study showed that feeding carbohydrate prevented hypoglycemia and reduced the effect of Hy on plasma FFA and liver total fatty acid accumulation. Dosages used were: starch - 1.2 g/kg; glucose - 3 g/kg; and Hy - 1.2 mM/kg (about 0.6 x LD50, injected i.v. at pH 7.4). In non-fed rats, 105 min. after Hy injection, blood glucose and plasma FFA were, respectively, 25% below and 100% above levels in saline-treated controls. In starch-fed rats, Hy had no effect on blood glucose at this time but raised plasma FFA by 40%. In glucose-fed hyperglycemic rats, Hy produced a small transitory effect on plasma FFA. During a three-hour period after Hy injection, liver total fatty acids increased 16% in the hyperglycemic group but 86% in a hypoglycemic (non-fed) group. Apparently, blood glucose level was a major determinant of the extent to which Hy elevated plasma FFA, and the latter effect in turn influenced the rate of fat accumulation in the liver. (Author) (Document quoted in entirety.)

AD-616 164 Div. 16/1

Army Natick Labs., Mass.
TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN,
by Ralph F. Goldman, Edward B. Green, and P. F. Iampietro. 17 Jun 64, 7p
Unclassified report

Pub. in Journal of Applied Physiology v20 n2 p271-7 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Heat tolerance, Acclimatization), (*Acclimatization, Heat tolerance), Exercise, Body temperature, Pulse rate, Males, Humans, Perspiration.

Studies were conducted on 10-man groups exposed at rest to 51 different hot, wet environmental conditions. 'Tolerance times' of unacclimatized volunteers established objectively, as the time of occurrence of a rectal temperature of 102.5 F and/or a heart rate of 180 beat/min, were similar to reported values established on a subjective basis. The wet and dry bulb index (WD) of environment was the best predictor of tolerance time. Prior acclimatization to work in hot, dry conditions did not result in prolonged tolerance for resting men exposed to hot, wet environments; neither did it alter the rates of sweat production, the final skin temperatures, or the rates of increase in heart rate or rectal temperature during these resting, hot, wet environmental exposures. Finally, 'passive' resting in hot, wet environments (up to 3 hr/day) did not prolong tolerance times or induce other manifestations of heat acclimatization during subsequent resting exposures to hot, wet environments for either unacclimatized or prior, hot, dry, acclimatized subjects. (Author)

AD-616 165 Div. 16/1

Army Research Inst. of Environmental Medicine, Natick, Mass.
EFFECTS OF OVERHYDRATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT,
by Saul V. Moroff and David E. Bass. 15 Jun 64, 4p
Unclassified report

Pub. in Journal of Applied Physiology v20 n2 p267-70 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Heat tolerance, Body fluids), (*Acclimatization, Heat tolerance), Body temperature, Sweat cooling, Perspiration, Pulse rate, Exercise, Water, Stress(Physiology), Labor.

The question was asked whether men could work in the heat with less physiological strain if they drank water in excess of expected fluid losses than if they merely replaced their losses as they worked. Thirty volunteer soldiers walked on 2 successive days for 90 min at 3.5 mph on a level treadmill, at a temperature of 120/80 F dry bulb/wet bulb. Each man drank 2,000 ml water before the walk on one day and no water before the walk on the other; 1,200 ml were drunk during the walk on both days. Overhydration resulted in significantly lower rectal temperatures and pulse rates and significantly higher sweat rates than did the control state. Two matched groups of six men each were then acclimatized to heat by daily 100-min walks under the conditions described above. One group was overhydrated during each day of the acclimatizing period; the other was not. Overhydration did not affect the pattern of acclimatization to heat; conversely, acclimatization to heat did not alter the above-described acute response to overhydration. The hypothesis that overhydration is beneficial to men working in the heat was supported by this study. (Author)

AD-616 169 Div. 16/3, 4/3

California Univ., Los Angeles. School of Medicine.
STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES,
by John E. Creange and Sidney Roberts.
28 Jan 65, 6p
Grant NSF GB2500, Proj. NR110 402
Unclassified report

Pub. in Biochemical and Biophysical Research Communications v19 n1 p73-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Steroids, Oxidation), (*Enzymes, Stimulation), (*Adenosine phosphates, Biochemistry), Nucleotides, Monocyclic compounds, Adrenal glands, Corticosteroid agents, Alchohols, Saccharide phosphates, Tracer studies, Progesterone.

Cyclic 3',5'-adenosine monophosphate (cyclic 3',5'-AMP) has recently been shown to stimulate selectively steroid C-11-beta hydroxylase activity in rat adrenal homogenates fortified with glucose-6-phosphate (G-6-P) and NADP(+) (Nature, 203:759, 1964). The effect of the cyclic nucleotide was presumed to be mediated via stimulation of alpha-glucan phosphorylase, which in turn led to enhanced production of G-6-P from glycogen and a concomitant increase in NADPH generation. However, if cyclic 3',5'-AMP stimulated steroid 11-beta-hydroxylation in adrenal homogenates only by this mechanism, its effects on steroid hydroxylations should be accentuated under conditions where G-6-P concentrations were limiting and eliminated in the presence of maximally effective amounts of this hexose phosphate. The experiments reported demonstrate that this is not the case and also provide evidence that the corticosteroidogenic effect of the cyclic nucleotide in adrenal homogenates is not dependent upon enhanced NADPH generation. (Author)

AD-616 170 Div. 16/1

Baylor Univ., Houston, Tex. Coll. of Medicine.
EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS,
by S. Deavers, E. L. Smith, and R. A. Huggins.
12 Oct 64, 5p
Unclassified report

Research done in cooperation with Univ. of Texas Dental Branch, Houston.
Pub. in Proceedings of the Society for Experimental Biology and Medicine v118 p301-4 1965 (Copies not available to DDC or Clearinghouse customers).
Research supported by Public Health Service, Washington, D.C., and Medical Research and Development Board, Office of the Surgeon General, Washington, D.C.

Descriptors: (*Blood transfusions, Blood volume), (*Erythrocytes, Blood transfusions), (*Blood volume, Blood transfusions), Liver, Obstruction(Physiology), Tracer studies, Cannulation, Hematocrit, Blood circulation, Blood plasma, Blood pressure.

Although, in previous experiments (3) when an overtransfusion of blood was given, the liver was the primary organ in which red cells were trapped, the present experiments indicate that in the absence of the liver from the circulation other organs or areas of the circulation are able to trap red cells in significant volume. In fact, in the present experiment with the liver removed from the circulation and an overtransfusion, the percentage of red cells trapped was distinctly greater than with an overtransfusion alone. Also, the volume of cells trapped was greater in proportion to the amount of blood transfused. In the present experiment the bypass and a transfusion of 45 ml/kg of blood resulted in 6 ml/kg of trapped cells while, with a transfusion of 50 ml/kg in intact dogs, red cells were not trapped (unpublished data). Previously, in order to obtain a comparable degree of red cell trapping in intact dogs, a transfusion of 114 ml/kg of blood was required.

AD-616 177 Div. 16/13, 16/10

Presbyterian-St. Luke's Hospital, Chicago, Ill.
THE RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS,
by John H. Olwin and J. L. Koppel. 1962, 13p
Contract DA49 007MD275; Grant H3940
Unclassified report

Pub. in Annals of the New York Academy of Sciences v115 art1 p43-55 Jul 9 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blood coagulation, Blood diseases), (*Surgery, Hemorrhage), (*Hemorrhage, Blood diseases), Blood vessels, Anticoagulants, Blood transfusions, Blood plasma, Pathology.

It is the purpose of this paper to outline the problems of bleeding that may confront the surgeon, particularly those problems that may be related to coagulation-factor deficiencies; to suggest methods of identifying hemostatic abnormalities present in the patient prior to, as well as developing unexpectedly during, surgery; and to outline methods of treatment for the various deficiencies. (Author)

AD-616 178 Div. 16/10, 16/11, 16/13

Presbyterian-St. Luke's Hospital, Chicago, Ill.
PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA,
by John H. Olwin and J. L. Koppel. 1963, 6p
Contract DA49 193MD2171
Unclassified report

Pub. in Clinical Orthopaedics n28 p89-94 1963
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blood vessels, Embolism), (*Embolism, Blood vessels), (*Anticoagulants, Embolism), Musculoskeletal system, Medicine, Blood coagulation, Prothrombin, Heparin, Coumarins, Drugs, Hemorrhage, Surgical techniques, Veins, Arteries, Lungs, Diagnosis, Therapy.

An attempt is made to present the principles and the practical considerations involved in the prophylactic and the active treatment of phleboembolism in the orthopaedic patient. The discussion is centered primarily around the use of anticoagulant therapy and includes a brief explanation of the mechanism of blood clotting as it is understood today, types of anticoagulants, choice of drugs, their mode of action, methods of administration and control, routine of induction and maintenance and countermeasures to the effects of the drugs. Included, also, are suggestions for treatment when anticoagulants may be contraindicated or ineffectual. (Author)

AD-616 180 Div. 16/1

Presbyterian-St. Luke's Hospital, Chicago, Ill.
SPECTROPHOTOMETRIC MODIFICATION OF THE TAMe ASSAY FOR PROTHROMBIN,
by Dorothy A. Hough, Lillian V. Lyons, Johannes L. Koppel, and John H. Olwin. 1962, 5p
Contract DA49 193MD2171; Grant NIH HE05964 0251
Unclassified report

Pub. in The Journal of the American Medical Association v188 n3 p207-11 Apr 20 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Prothrombin, Test methods), (*Anticoagulants, Therapy), Spectrophotometers, Biological assay, Measurement, Drugs.

The purpose of the paper is to describe a new prothrombin assay and to report results of its use in the control of anticoagulant therapy in 1,414 patients. The assay is a spectrophotometric modification of the original TAMe procedure and is based on the esterolytic action of thrombin on p-tosyl-l-arginine methyl ester (TAMe). The assay was performed in parallel with the one-stage, two-stage, and Thrombotest assays in patients during anticoagulant therapy induction, maintenance (long and short-term), and recovery periods, the results closely paralleling those of the two-stage procedure. Because of (1) the uniform reproducibility of its results, (2) the simplicity with which it can be performed, and (3) its ready adaptability to routine clinical use, the authors have found it the most satisfactory prothrombin assay they have used. (Author)

AD-616 181 Div. 16/1, 16/10

North Carolina Univ., Chapel Hill. School of Medicine.
SOME EFFECTS OF ANOXIA ON TISSUE METABOLISM,
by A. P. Sanders, D. M. Hale, and A. T. Miller, Jr.
1965, 1p
Contract DA49 193MD2371
Unclassified report

Pub. in Federation Proceedings v24 n2 Mar-Apr 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Anoxia, Metabolism), (*Metabolism,

Anoxia), (*Adenosine phosphates, Anoxia), Liver, Kidneys, Brain, Respiration, Phosphorylation, Hypoxia, Tissues(Biology), Rats.

Autolysis of rat liver, kidney and brain at 37C resulted in the rapid disappearance of labile ATP and a progressive decline in the capacity for respiratory control, but no decrease in the capacity for oxidative phosphorylation until the duration of autolysis exceeded 1 hour. When animals breathed 5% O2 - 95% N2 for 105 minutes, reductions in tissue ATP were liver 40%, brain 20%, kidney no reduction. The rate of incorporation of C14-leucine into protein was moderately depressed in brain and kidney and severely depressed in liver. Post-hypoxia tissue homogenates had no impairment in basal respiration, respiratory control or oxidative phosphorylation. It may be concluded that the early consequences of anoxia are due mainly to reduction in tissue ATP levels and that impairment in ATP production capacity is a later occurrence. (Author) (Document quoted in entirety.)

AD-616 198 Div. 16/2, 16/3

Hood Coll., Frederick, Md.
THE CHEMISTRY OF THE CELL WALLS OF BACILLUS ANTHRACIS: THE EFFECT OF PENICILLIN,
by Ronald S. Ratney. 11 Sep 64, 5p
Contract DA49 193MD2604
Unclassified report

Pub. in Biochemica et Biophysica Acta v101 p1-5 1965 (Copies available only to DDC users).

Descriptors: (*Bacillus anthracis, Cell wall), (*Penicillins, Bacillus anthracis), Membranes(Biology), Peptides, Glycoproteins, Amino acids, Carbohydrates, Glutamic acid, Biosynthesis, Inhibition.

Cell wall mucopeptide of Bacillus anthracis, strain V1B-189 was prepared from cells grown in the presence and absence of penicillin. Both types contain an unusual inner membrane. These were analysed for reducing sugars, amino sugars and amino acids. Both types contained glutamic acid, alanine and diaminopimelic acid as the principle amino acids in the mole ratios of 1:1.5:1. Penicillin did not change the relative amounts of the different cell wall constituents but it did reduce the weight of all constituents per unit weight of mucopeptide. (Author)

AD-616 201 Div. 16/2, 16/1

Johns Hopkins Univ., Baltimore Md. School of Medicine.
THE STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS; APPLICATION TO THE ENUMERATION OF SAC'4,
by Louis G. Hoffmann, Ann T. McKenzie, and Manfred M. Mayer. 1 Aug 64, 26p
Contract Nonr24860; Grant NSF G19372
Unclassified report

Pub. in International Journal of Immunichemistry v2 p13-38 1965 (Copies available only to DDC users).

Descriptors: (*Immunology, Antigen-antibody reactions), (*Antigen-antibody reactions, Complement), (*Hemolysis, Antigen-antibody reactions), Theory, Erythrocytes, Mammals, Guinea pigs, Antigens + antibodies, Immune serums, Ions.

The occurrence of a steady state in the reaction between EAC'4, C'1a and C'2 has been demonstrated. This steady state is characterized by a constant concentration of SAC'1a,4,2a+SAC'4,2a and a slow linear decrease in C'2 concentration. A model for this system, which is based on the assumptions that C'1a combines reversibly with SAC'4 and that the formation of SAC'1a,4,2a from SAC'1a,4 conforms to enzyme kinetics, accounts for all the observed properties of the reaction. Detailed analysis of the system indicates that it provides a method for the enumeration of SAC'4 in a preparation of EAC'4. (Author)

AD-616 226 Div. 16/10

Washington Univ., Seattle.
EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES,
by Benjamin F. Trump, Douglas E. Young, Eugene A. Arnold, and Robert E. Stowell. 1965, 26p
Grant NIH AM07919
Unclassified report

Work supported in part by American Cancer Society.
Pub. in Dederation Proceedings v24 n2(pt3) pS144-68 Mar-Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Freezing, Cytoplasm), (*Cytoplasm, Freezing), Cytology, Histological techniques, Tissues(Biology), Mitochondria, Cells(Biology), Membranes(Biology), Morphology(Biology), Enzymes, Biochemistry, Pathology.

AD-616 228 Div. 16/10, 16/3, 16/1

California Univ., San Francisco. Medical Center.
IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID,
by Mitsuo Yokoyama and Elizabeth Roboz Einstein. 1965, 16p
Contract Nonr365612, Proj. NR105 308
Unclassified report

Pub. in Annals of the New York Academy of Sciences v121 n3 p439-54 Mar 31 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cerebrospinal fluid, Electrophoresis), (*Antigens + antibodies, Cerebrospinal fluid), Immunity, Diagnosis, Diseases, Antigen - antibody reactions, Immune serums, Gamma globulin, Proteins.

Reported and fully confirmed is the finding that in multiple sclerosis the gamma globulin of the CSF is increased significantly. The primary purpose of these investigations was to study the presence of the proteins classified as antibodies in comparison with serum. Rabbits were injected with concentrated fluid and the anti-CSF serum tested by Ouchterlony and immunoelectrophoretic techniques. Antisera to CSF, to human serum, and specific antisera to 7 S gamma, beta-2A (gamma-1A) and beta-2M (gamma-1M) were used. Antisera to fibrinogen, transferrin, ceruloplasmin and to beta-1 lipoprotein were also applied and with most CSF the reaction was positive. The immunoelectrophoretic pattern revealed some minor gamma globulins which remained after absorption with human sera and with 7 S gamma globulin. These minor gamma globulins do not have their counterpart in the sera of the same patients. Cerebrospinal fluids with high gamma globulin content have been assayed by immunoelectrophoresis using rabbit antisera containing only antibody against the gamma-C globulin prepared and provided by Catherine F. C. MacPherson of McGill University. The position of antigen antibody arch and disappearance of this line after absorption (of CSF) with this particular antisera indicate that the gamma globulin designated as gamma-2-2 is identical with MacPherson's gamma-C. (Author)

AD-616 257 Div. 16/9, 32/1

American Geographical Society, New York.
THE ECOLOGY OF MALNUTRITION IN MIDDLE AFRICA (GHANA, NIGERIA, REFUBLIC OF THE CONGO, RWANDA BURUNDI, AND THE FORMER FRENCH EQUATORIAL AFRICA), VOLUME V.
Edition no. 1,
by Jacques M. May. 1965, 266p
Contract DA19 129QM1946N

Unclassified report

Rept. on Studies in Medical Geography
Available from Hafner Publishing Co., Inc., New York, 31 East 10th Street $9.50.

Descriptors: (*Nutrition, Africa), (*Agriculture, Africa), Tropical regions, Deficiency diseases, Ecology, Food, Animals, Production, Diet, Population, Geography, Maps, Tables.

The volume is concerned with the food geography of Middle Africa, involving primitive tropical agriculture and limited livestock economy. Middle Africa depends on manioc, sweet potatoes, beans, sorghum, and plantain raised in a dry-farming economy in which the chief implement is the hoe. Attempts to solve the problems of malnutrition must begin with a knowledge of the distinctive food geography of the region, as must the plans of any group that may have to support a staff of its own in the region.

AD-616 280 Div. 16/2
CFSTI Prices: HC$1.00 MF$0.50

Army Biological Labs., Frederick, Md.
REPRINT ACCESSION LIST 1964.
Jun 65, 19p

Unclassified report

Also available from Technical Releases Branch, Technical Information Div., Fort Detrick, Frederick, Md.

Descriptors: (*Microbiology, Indexes), (*Biological laboratories, Reports), Bacteria, Viruses, Microorganisms, Bacterial aerosols, Biochemistry, Immunology, Bacillus, Bacteriophages, Coccidioides, Culture media, Diseases, Hazards, Laboratory animals, Pasteurella, Ribonucleic acids, Desoxyribonucleic acids, Toxins + antitoxins, Vaccines.

The Reprint Accession List is a periodic compilation of technical articles by Fort Detrick scientists and contractors that have been cleared for public release and published in scientific journals and other open literature. It includes a list of the published articles by reprint number and subject and author indexes.

AD-616 311 Div. 16/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
OPPOSITE CHANGES IN ELECTROPHYSIOLOGICAL REACTIONS OF THE HUMAN BRAIN IN ADOPTING THE FREQUENCY OF LIGHT FLASHES AT VESTIBULAR AND OPTOKINETIC STIMULI,
by V. G. Samsonova. 13 May 65, 13p
FTD-TT-65-36
TT 65-62444

Unclassified report

Unedited rough draft trans. of Fiziologicheskii Zhurnal SSSR, v50 n6 p649-54 1964.

Descriptors: (*Cerebral cortex, Sensory perception), (*Sensory mechanisms, Stimulation), Brain, Electroencephalography, Adaptation(Physiology), Reflexes, Light, Vestibular apparatus, Eye, Vision, USSR.

Results of the investigation give bases to assume that the vestibular-oculomotorial system does not appear to be a simple reflectorial system, synonymously reacting to the stimulation of its various links. The nature of the interactions between these links is such that the stimulation of vestibular and optomotorial links affects in an opposite manner the level of excitability of the cortical structures connected with the analysis of light signals. The vestibular system has a depressing effect on the cortical structures of the visual analyzer, and the eyemotorial system exerts an opposite activating effect on the very same cortical structures. (Author)

AD-616 316 Div. 16/1, 12/1
CFSTI Prices: HC$2.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
AN INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS,
by R. S. Lincoln and J. E. Mangelsdorf. 28 Apr 65, 26p Rept. no. 6-65-65-15

Unclassified report

A paper presented at the Symposium on Human Physiological and Performance Determinants of Manned Space Systems Design, held at San Fernando Valley State College 14 Apr 65.

Descriptors: (*Space crews, Physiology), (*Astronauts, Performance tests), (*Space medicine, Telemeter systems), Performance(Human), Manned spacecraft, Space flight, Monitors, Display systems, Data processing systems, Digital computers, Electrocardiography, Symposia.

Recognizing the need for a comprehensive crew-monitoring program, the Lockheed Missiles and Space Company has initiated an independent development project concerned with all major aspects of crew monitoring-from the development of measurement techniques to the interpretation of processed data. The objectives of the project are: (1) to develop an automatic system to assist in monitoring crew performance capabilities and physiological state, and (2) to develop digital techniques for processing, displaying, and analyzing obtained data. (Author)

AD-616 362 Div. 16/8, 30/2
CFSTI Prices: HC$2.00 MF$0.50

Georgia Inst. of Tech., Atlanta.
AN INVESTIGATION OF EDP APPLICATIONS IN USAF HOSPITALS.
Special Problem rept.,
by Robert I. Thompson, Jr. Jun 65, 47p

Unclassified report

Master's thesis.

Descriptors: (*Hospitals, Data processing systems), (*Air Force, Hospitals), (*Military medicine, Data processing systems), Statistical analysis, Diagnosis, Data storage systems, Medical personnel, Tables.

The primary purpose of this study is to investigate current applications of EDP in hospitals with particular emphasis on uses being made by USAF hospitals. A secondary purpose is to suggest or develop proposals for areas of future applications in USAF hospitals. The results of this study will also provide a foundation upon which further and more detailed investigations may be based.

AD-616 364 Div. 16/4
CFSTI Prices: HC$3.00 MF$0.75

Oklahoma State Univ., Stillwater.
THE SENSORY RESPONSES OF THE HOUSE FLY, MUSCA DOMESTICA LINN., TO ATTRACTANTS.
Doctoral thesis,
by Dean A. Garrett. May 65, 80p
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Musca, Sensory perception), (*Insect repellants, Musca), Muscidae, Insect control, Anesthesia, Freezing, Exposure, Behavior, Thresholds(Physiology), Smell, Colors, Light, Stimulation, Tests.

Anesthetization (cold) and aspiration tests were conducted with house flies to determine detrimental effects to the flies. Olfactometer tests were conducted with over 40 chemical materials for their attractiveness or repellency to house flies. Tests were conducted with live house flies in cages, dead flies and simulated flies to determine their attractiveness to other house flies. Tests were conducted to determine if flies contributed something to the food while feeding that was attractive to other house flies. Different colored papers, backgrounds and lights were tested for their attractiveness to house flies. Behavioral studies were made on house flies to determine the roles aggregation, tracking patterns and feeding may have in respect to house fly attractiveness. (Author)

AD-616 372 Div. 16/1, 15/1

RAND Corp., Santa Monica, Calif.
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
by George B. Dantzig, James C. DeHaven, Irwin Cooper, Selmer M. Johnson, and Crawford F. Sams.
28 Sep 59, 101p Rept. no. P-1811
Unclassified report

Prepared in cooperation with Univ. of California. Available only for reference use at DDC Field Services. Copy not available for public sale.

Descriptors: (*Mathematical models, Respiratory system), (*Respiratory system, Mathematical models), Physiology, Chemical equilibrium, Humans.

This study examines the thesis that a part of the human physiological system can be simulated by a suitably constructed mathematical model. The model employed derives from a class of mathematical programming methods that were originally developed for representing complex military and industrial activities and have recently been used to represent involved chemical equilibria. The motivation for this research is the long-range view that a successful mathematical simulation of the human system or of human subsystems would provide an important tool for biological investigations. A sufficiently complex mathematical model - that is, a model that embodies sufficient chemical and biological detail to represent a whole, functioning human system or subsystem - could be used to explore biological hypotheses, environmental stress reactions, and interplay of dependent subsystems, and could serve as a pedagogical tool or even as an aid to medical diagnosis.

AD-616 393 Div. 16/10, 16/1, 20/6
CFSTI Prices: HC$6.00 MF$1.25

Rochester Univ., N. Y. School of Medicine and Dentistry.
MEGAKARYOCYTE AND PLATELET PRODUCTION IN NORMAL DOGS AND DOGS SUBJECTED TO THREE TYPES OF MARROW STRESS.
Doctoral thesis,
by Joseph Edward Traynor. 1965, 217p
Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Bone marrow, Pathology), (*Radiation effects, Hemopoietic system), (*Hemopoietic system, Bone marrow), (*Blood platelets, Hematology), (*Erythrocytes, Hematology), Stress(Physiology), Hormones, Estrogens, Testosterone, Whole body irradiation, Partial body irradiation, X rays, Classification, Morphology(Biology), Dogs.

Experimental studies on megakaryocytes and platelets were performed on normal dogs, hormone (testosterone, Premarin, and estrone) treated dogs, acutely bled dogs and dogs exposed to LD 36/30 doses of X-Rays. The irradiation studies included whole body and partial body exposures. Parameters of investigation included enumeration and classification of megakaryocytes in aspirated bone marrow specimens and enumeration and volume measurements of the peripheral blood platelets. The methods developed for megakaryocyte enumeration and platelet volume analysis are presented. A morphological classification system, suitable for the dog megakaryocytes is presented with the aid of photomicrographs. Estrone, a non-water soluble, non-conjugated estrogen preparation, given in daily doses of 0.08 to 0.10 mgm/kg body weight for 21 days, produced marked platelet depression after 20 days of treatment. From the 26th to the 33rd day after initiation of treatment, bizarre megakaryocytes appeared in the bone marrow samples. These are likened to bizarre forms reported in tropical sprue. A transient influx of large platelets in the peripheral blood was concomitant with the megakaryocyte abnormalities. At this time, also, there was almost total absence of nucleated erythroid elements in the bone marrow. (Author)

07. Chemistry

AD-615 819 Div. 4/3, 4/4, 14/8
CFSTI Prices: HC$1.00 MF$0.50

Olin Mathieson Chemical Corp., New Haven, Conn.
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-m-CARBORANYLENESILOXANES,
by S. Papetti, B. B. Schaeffer, A. P. Gray, and T. L. Heying. Jun 65, 24p
Technical rept. no. TR-26
Contract Nonr 339500, Proj. NR356 431
Unclassified report

See also AD-436 271.

Descriptors: (*Organoboranes, Polymerization), (*Siloxanes, Polymerization), (*Heat-resistant materials, Siloxanes), Polymers, Preparation, Catalysts, Iron compounds, Chlorides, X-ray diffraction analysis, Thermal properties, Stability, Oxidation, Spectra(Infrared).

The following meta-carboranylene backboned polysiloxanes were obtained by ferric chloride catalyzed polymerizations: (-Si(CH3)2CB10H10CSi(CH3)2O-) from 1,7-bis(chlorodimethylsilyl)m-carborane plus bis (methoxydimethylsilyl)m-carborane; (I); (-Si(CH3)2CB10H10CSi-(CH3)2OSi(CH3)2O-) from dichlorodimethylsilane (II) plus I; (-Si(CH3)2CB10H10CSi(CH3)2OSi(CH3)2OSi(CH3)2O-) from a dimer of II plus I; (Si(CH3)2CB10H10Si(CH3)2OSi-(CH3)2OSi(CH3)2O-) from dilitho-m-carborane plus dichlorotetramethyldisiloxane. These compounds, and a number of substitution products thereof, were examined by X-ray diffraction and their thermal and oxidative behavior were studied by differential calorimetry.

AD-615 825 Div. 4/4, 4/3
CFSTI Prices: HC$1.00 MF$0.50

Army Missile Command, Redstone Arsenal, Ala.
AN IMPROVED STRUCTURE FOR TRIMETHYLAMINE,
by James E. Wollrab. 26 Aug 64, 13p
Rept. no. RF-TM-64-26
Unclassified report

Descriptors: (*Amines, Molecular structure), (*Molecular structure, Amines), (*Microwave spectroscopy, Amines), Deuterated compounds, Stereochemistry, Molecular spectroscopy, Electron transitions, Chemical bonds.

The Microwave spectrum of (CH2D)(CH3)2N(14) (trimethyl-d1 amine) was assigned and an improved structure obtained for trimethylamine. The methyl groups were found to be tilted in a manner similar to that observed in the other methyl substituted amines. (Author)

AD-615 870 Div. 4/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ALPHA-FERROCENYLCARBONIUM SALTS,
by A. N. Nesmeyanov and V. A. Sazonova.
11 May 65, 10p FTD-TT-65-433
TT 65-62394
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady v160 n2 p355-8 1965.

Descriptors: (*Ferrocenes, Salts), Metalorganic compounds, Perchlorates, Borates, Stability, Pyrolysis, Chlorides, USSR.

It was previously shown that the treatment of diphenylferrocenyl carbinol with an acid resulted in the formation of 6,6-diphenyl fulvene. Ferrocenyl carbonium salts of the acid have now been isolated as intermediates in the reaction. A detailed study was made of the properties of the stable perchlorate and tetraphenylborate salts of ferrocenylphenyl carbonium.

AD-615 900 Div. 4/3
CFSTI Prices: HC$3.00 MF$0.75

Maryland Univ., College Park. Dept. of Chemistry.
AN INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3,5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
Final rept.,
by G. Forrest Woods. Mar 65, 62p
Contract AF33 657 7833, Proj. 7023, Task 702301
ARL 65-55
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Aromatic compounds, Polymers), (*Polymers, Aromatic compounds), (*Aliphatic compounds, Synthesis(Chemistry)), (*Amines, Catalysis), Stereochemistry, Molecular structure, Polycyclic compounds, Chemical bonds, Catalysts, Aluminum compounds, Oxides, Vapors, Elimination reactions, Ammonia, Alkenes, Nitriles, Dehydrogenation, Degradation, Polymerization, Pyrolysis.

The results of the synthesis of intermediates which will be utilized in the attempted syntheses of ring polyphenylenes are reported. Experimental procedures were devised and preliminary work accomplished on an 'all-meta-' hexaphenylene, an octaphenylene which contains both meta- and paralinkages, and a quinquephenylene which contains within the same molecule ortho-, meta-, and para- linkages. The possibility of migration of unsaturation through or across a benzene nucleus was examined and tentatively it seems that this phenomena has taken place. The syntheses of the 1-,2-,3-chloro-1, 3,5-hexatrienes were accomplish. The geometrical configuration of the less stable isomer of 1,3,5-hexatriene was established by a stereospecific synthesis. The catalytic deamination reaction which in a rather formal way parallels the dehydration of alcohols was explored. (Author)

AD-615 932 Div. 4/4, 25/3
CFSTI Prices: HC$2.00 MF$0.50

Electro-Optical Systems, Inc., Pasadena, Calif.
THE IONIZATION OF CESIUM IN TUNGSTEN CAPILLARIES,
by A. Theodore Forrester. Jul 64, 46p
EOS research rept. no. EOS-RR-20
Unclassified report

Descriptors: (*Cesium, Ionization), (*Ionization, Cesium), Diffusion, Tungsten, Transport properties, Vapors, Ionic current, Work functions, Differential equations, Analysis, Space charges.

The transport of cesium through a tungsten capillary occurs through two phases, an adsorbed layer and a vapor. In this analysis these two phases are connected by the experimentally observed relationship, rather than by an linearized approximation to it. The choice of allowed solutions is then made by a precise boundary matching to solutions computed for the surface onto which the capillary opens. This analysis leads naturally to the

possible existence of three different states of the system for a wide variety of capillary sizes, temperatures, and flow rate conditions. These three states have been correlated with the front surface emitting, pore emitting, and non-emitting states which have been observed to co-exist for a porous ionizer. It is predicted that the coexistence of three different states will disappear when the capillaries become extremely fine. When cesium vapor flows through a heated tungsten capillary the density of adatoms decreases in the direction of flow. The resulting variation in work function leads to contact potential gradients within the pore which accelerate ions in the direction of flow. A consequence of these fields, an enhancing of the ion emission from the capillary, is observed in ion emission micrographs. (Author)

AD-615 955 Div. 4/3, 14/8
CFSTI Prices: HC$0.50 MF$0.50

Coating and Chemical Lab., Aberdeen Proving Ground, Md.
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS-LIQUID CHROMATOGRAPHY,
by George G. Esposito. 24 May 65, 11p
CCL-180
Proj. 1C024401A329
Unclassified report

Descriptors: (*Epoxy plastics, Additives), (*Additives, Chromatographic analysis), (*Chromatographic analysis, Ethers), Chemical reactions, Butanols, Propanols.

Programmed temperature gas chromatography (PTGC) is employed for the identification and determination of epoxy type reactive diluents in solventless epoxy compounds. The analysis can be applied directly to the product to be tested or, in the case of butyl glycidyl ether, to a sample separated from the resin. (Author)

AD-615 959 Div. 4/3
CFSTI Prices: HC$1.00 MF$0.50

Space-General Corp., El Monte, Calif.
A SIX-BORON CARBORANE (CH3)2C2B6H6 AND B6H10:P (C6H5)3 FROM HEXABORANE-10,
by Robert E. Williams and F. James Gerhart.
1 Jun 65, 9p Technical rept. no. TR-7
Contract Nonr438100, Proj. NR356 461
Unclassified report

Descriptors: (*Organoboranes, Synthesis(Chemistry)), Heat-resistant materials, Phosphines, Organic phosphorus compounds, Aliphatic compounds, Alkenes, Nuclear magnetic resonance, Molecular structure.

The synthesis of the carborane C2B6H8 (Dicarbaclovooctaborane-8), which was expected to be thermally quite stable, was approached from several standpoints. Heating mixtures of B6H10 (Hexaborane) and ethylene resulted only in a very slight decomposition of hexaborane. The reaction of hexaborane with (C6H5)3P (Triphenylphosphine) gave the adduct B6H10:P(C6H5)3 (m.p. 168-171C). Mass spectroscopy of the reaction products of mixtures of hexaborane plus 1,2-dimethyl acetylene revealed the presence of (CH3)2C2B6H6 (m.p.-58 to -63C). A structure for the latter compound is proposed.

AD-615 966 Div. 4/4, 14/8
CFSTI Prices: HC$1.00 MF$0.50

Air Force Materials Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio.
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
Rept. for Jan-Nov 64,
by Matatiahu Gehatia. Apr 65, 25p
ML TR-64-377
Proj. 7340, Task 734004
Unclassified report

Descriptors: (*Polymers, Physical properties), (*Ultracentrifuges, Polymers), Molecular weight, Elasticity, Stochastic processes, Differential equations, Centrifugal fields.

AD-615 976 Div. 20/1, 15/1, 25/5
CFSTI Prices: HC$5.00 MF$1.25

Lockheed Missiles and Space Co., Palo Alto, Calif. Research Labs.
EXCITED-STATE WAVE FUNCTIONS.
Rept. for 12 Aug 63-12 Nov 64,
by P. S. Kelly, J. Sokoloff, B. H. Armstrong, P. Altick, and M. Cohen. Apr 65, 187p
Contract AF29 601 6199, Proj. 8806
WL TR-64-172
Unclassified report

Descriptors: (*Excitation, Atoms), (*Special functions(Mathematical), Excitation), (*Field theory, Excitation), Electron transitions, Perturbation theory, Ground state, Atomic energy levels, N-body problem, Quantum mechanics, Electrostatic fields, Corrections, Beryllium, Boron, Carbon, Fluorine, Neon, Oxygen, Operators(Mathematics), Integrals.

Analytic self-consistent field functions were determined for the 20 L-S coupled terms of the configurations 1s22s22pk3s, and for the 56 terms of the configurations 1s22s22pk3d where k = 0, 1, 2, 3. These functions were employed in the computation of oscillator strengths. Analytic self-consistent field wave functions are presented for ten terms in Be, B, C, F, and Ne. Radial equations for open-shell atoms in the unrestricted H-F approximation were derived in general form. A program was completed for the calculation of the continuum of the ground-state H-F operator in the application of the Goldstone many-body formalism to the calculation of correlation energies of finite atoms. An analysis of the Coulomb approximation (CA) of Bates and Damgaard is presented, by comparison of CA wave functions with H-F wave functions, and by a derivation of an approximate one-electron equation which indicates the choice of experimental energy parameter. A discussion of the normalization of CA wave functions is given along with a discussion of the relevance of effective range theory to the CA, and the calculation of some effective ranges in oxygen. Extended tables of CA radial dipole integrals are presented. (Author)

AD-615 983 Div. 4/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
RADIATION POLYMERIZATION ON n=HEPTENE IN PRESENCE OF TiCl4,
by Yu. A. Kolbanovskii, L. S. Polak, and E. B. Shlikhter. 13 May 65, 11p FTD-TT-65-31
TT 65-62409
Unclassified report

Unedited rough draft trans. of Neftekhimiya (USSR) v3 n2 p222-6 1963.
Available copy will not permit fully legible reproduction.

Descriptors: (*Alkenes, Polymerization), (*Radiation chemistry, Alkenes), Titanium compounds, Chlorides, Catalysts, USSR.

Radiation polymerization of n-heptene-1 was investigated in presence of TiCl4, as well as the effect of dosage, dosage power and radiation temperature, amount of catalyst and dilution on the yield of the polymer. It was shown, that in diluted solutions and at lower temperatures, optimum conditions for polymerization with TiCl4 are created. When calculating energy absorbed by monomer only, the values of radiation-chemical yield constitute approx. 50 mol/100 ev. It was established that the polymer yield depends upon dosage power in degree 0.8. (Author)

AD-615 989 Div. 4/4, 4/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CATALYSIS OVER AN ORGANIC SEMICONDUCTOR, OBTAINED ON THE BASIS OF POLYACRYLONITRILE,
by L. A. Lyatifova and M. M. Sakharova.
13 May 65, 7p FTD-TT-65-41
TT 65-62415

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Azarbaidzhanskoi SSR, Baku. Doklady v20 n1 p31-3 1964.
Available copy will not permit fully legible reproduction.

Descriptors: (*Catalysts, Semiconductors), (*Semiconductors, Catalysis), (*Acrylonitrile polymers, Catalysis), Nickle compounds, Nitrates, Formates, Alcohols, Decomposition, Reaction kinetics, USSR.

A study was made of the catalytic activity of the organic semiconductor nickel-doped-polyacrylonitrile. The composition was found to catalyze the dehydrogenation of formic acid, but to have no caztalytic effect on the decomposition on isopropanol.

AD-615 991 Div. 4/3, 14/8
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN,
by N. A. Adrova, A. M. Dubnova, and M. M. Koton.
4 Jun 65, 8p FTD-TT-65-304
TT 65-62417

Unclassified report

Unedited rough draft trans. of * Vysokomolekulyarnye Soedineniya (USSR) v6 n8 p1493-5 1964.
Available copy will not permit fully legible reproduction.

Descriptors: (*Polyamide plastics, Synthesis(Chemistry)), (*Benzimidazoles, Polymers), Heat-resistant plastics, Molecular structure, Spectra(Infrared), Stability, Aromatic compounds, Amines, Condensation reactions, USSR.

Polymers with benzimidazoline units in the principal chain were synthesized by polycondensation of 3,3',4,4'-tetraaminodiphenyl with aromatic dicarbonyl compounds. The latter comprised aromatic dialdehydes and their acetals and aromatic diacetyl compounds. The polymers were obtained in the form of non-fusible, light brown powders. (Author)

AD-616 031 Div. 25/7, 4/2, 4/4

Institute of Optics, Univ. of Rochester, N. Y.
POLARIZED EMISSION FROM KI:T1 AT 12K,
by Robert Edgerton. 3 Aug 64, 3p

Unclassified report

Pub. in Physical Review v138 n1 pA85-7 Apr 1965
(Copies not available to DDC or Clearinghouse customers).
Supported in part by ARO(D).

Descriptors: (*Potassium compounds, Iodides), (Thallium, Impurities), (*Band spectrum, Polarization), Cryogenics, Excitation, Atomic energy levels, Electron transitions.

KI:Tl was excited with linearly polarized light in each of the four impurity-absorption bands. At temperatures below 30K, the emission was strongly polarized in some of the emission bands. Excitation in the A band yields polarized emission in the 3356-A band. Excitation in the B and C absorption bands yields polarized emission in the 2870- and 2783-A emission bands, respectively, and no detectable polarization in the 3078-, 3356-, or 4300-A emission bands. These facts are interpreted using a model previously introduced for thallous-ion emission. (Author)

AD-616 037 Div. 20/1, 25/6

Illinois Univ., Urbana. Dept. of Physics.
SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129,
by D. W. Hafemeister, G. DePasquali, and H. DeWaard. 16 Apr 64, 15p
Contract AF49 638 1048, Proj. 9761, Task 976103
AFOSR 65-0772

Unclassified report

Pub. in Physical Review v135 n5B pB1089-1101 Sep 7 1964 (Copies not available to DDC or Clearinghouse Customers).

Descriptors: (*Mossbauer effect, Iodine), (*Iodine, Isomeric transitions), Solid state physics, Nuclear properties, Ions, Nuclear structure, Iodides, Iodates, Chemical bonds, Nuclear magnetic resonance, Nuclear moments, Cryogenics.

The Mossbauer effect of the 26.8-keV transition in I129 was studied in a number of iodine compounds. The following results were obtained: (a) The isomeric shifts for the alkali iodides were found to be linearly dependent on the number of 5p holes in the iodine ion. From this dependency, a calibration of the isomeric shift scale in terms of the 5s-electron density was obtained. The s and p populations inferred from these data are in sharp disagreement with those predicted by the simple theory of electronegativity. An explanation for this discrepancy is given. (b) From the calibration mentioned under (a), a relative change of nuclear radius delta R/R = 0.00003 is computed. (c) The isomeric shifts for some iodates indicate that their 5s-electron density is about 18% larger than that of the iodides. This increase is caused by the partial removal of 5p electrons from iodine in the I-O bonds, which results in reduced screening of the 5s electrons. The shift for potassium periodate implies that the 5s-electron density is decreased by 33% compared to the iodate. This decrease is attributed mainly to the sp hybridization of the I-O bonds in KIO4. The average charge removed per I-O bond, calculated from the isomeric shifts of the iodates and periodate, is 0.61 e. (d) The quadrupole splitting of KIO3 was used to determine the I129 quadrupole ratio. The asymmetry of the iodate spectrum and the sign of the quadrupole moment show that the sign of the iodate field gradient is negative. (Author)

AD-616 062 Div. 4/4, 16/3

Roswell Park Memorial Inst., Buffalo, N. Y.
PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE,
by Harold C. Box and Harold G. Freund. 15 Jun 64, 2p
Contract Nonr297500, Proj. NR304 457 Unclassified report

Pub. in Journal of Chemical Physics v41 n8 p2571 Oct 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Amino acids, Paramagnetic resonance), (*Paramagnetic resonance, Amino acids), Chlorides, Absorption spectrum, Crystals, Ions, Cryogenics.

The paramagnetic absorption spectrum of a single crystal of L-cystine dihydrochloride x irradiated at 4.2K is shown. The two principal components of the absorption spectrum, designated alpha and beta, are due to positive and negative ions in which the unpaired electron is localized primarily on the disulfide group. The absorption spectra of these ions are distinguished by the following characteristics: (1) The ions give rise to a single absorption pattern. Since the crystal structure of L-cystine dihydrochloride is such that the two halves of the molecule are related by a twofold axis, the absorption patterns of all other paramagnetic species occur in duplicate related by the twofold axis. (2) There is a large g-value variation due to spin-orbit coupling as expected for sulfur electrons. (3) In the case of the alpha absorption the hyperfine pattern indicates an interaction between the unpaired electron and the protons of the adjacent CH2 groups. Upon warming, the paramagnetic absorption spectrum undergoes a sequence of changes until finally, after several hours at room temperature, the stable absorption reported by Kurita and Gordy is obtained. The stable absorption is presumably due to neutral free radicals. (Extracted)

AD-616 063 Div. 25/7

Roswell Park Memorial Inst., Buffalo, N. Y.
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACID IRRADIATED AT LOW TEMPERATURE,
by Harold C. Box, Harold G. Freund, and Kenneth T. Lilga. 5 Oct 64, 5p
Contract Nonr297500, Proj. NR304 457
Unclassified report

Pub. in Journal of Chemical Physics v42 n5 p1471-4 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Carboxylic acids, Paramagnetic resonance), (*Paramagnetic resonance, Carboxylic acids), (*Nuclear magnetic resonance, Carboxylic acids), Single crystals, Low-temperature research, Deuterated compounds, Cryogenics, Radiation damage, X rays.

Electron spin resonance absorption was observed in single crystals of (-CH2-COOH)2, (-CH2-COOD)2, and (-CH2-C(13)00H)2 irradiated at 77 degrees K. The principal paramagnetic species observed at low temperature has an unpaired electron in a 2 p-pi orbital on the carbon atom of the carboxyl group. It is probably ionized succinic acid with the oxygen of the carboxyl group carrying a negative charge. (Author)

AD-616 071 Div. 4/4, 25/6

Virginia Univ., Charlottesville.
THE SHEAR STRENGTHS OF SOME SOLIDIFIED GASES.
Revised ed.,
by Laird C. Towle. 19 Dec 63, 6p
AROD 3084:6
Unclassified report

Pub. in Journal of Physics and Chemistry of Solids v26 p659-63 1965 (Copies available only to DDC users) Revision of manuscript submitted 1 Nov 63.

Descriptors: (*Solidified gases, Mechanical properties), Argon, Krypton, Hydrogen, Cryogenics, High pressure research, Indium, Shear stresses.

The shear strengths of solid argon, krypton and hydrogen have been measured at pressures up to 8000 kg/sq cm in an extrusion apparatus. Argon and krypton were examined at 77K; hydrogen at 4.2K. Indium was also tested at room temperature and served as a control. The shear strength of the solidified gases, which was initially in the range from 1 to 20 kg/sq cm, was found to increase by about an order of magnitude in the pressure range investigated. (Author)

AD-616 074 Div. 4/4, 4/3

IIT Research Inst., Chicago, Ill. Technology Center.
NORMAL COORDINATE ANALYSES OF HYDROGEN-BONDED COMPOUNDS. III. THE ACID MALEATE ION,
by Kazuo Nakamoto, Y. Anantarama Sarma, and George T. Behnke. 23 Sep 64, 6p
Contract DA31 124AROD38
AROD 3899:4
Unclassified report

Pub. in Journal of Chemical Physics v42 n5 p1662-7 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Chemical bonds, Spectra(Infrared)), (*Infrared spectroscopy, Dibasic acids, Spectra(Infrared)), Deuterated compounds, Ions, Band spectrum, Molecular properties.

The infrared spectra of the acid maleate ion and its two deutero analogs were obtained from 4000 to 160/cm. In order to estimate the Urey-Bradley force constants, a normal coordinate analysis was carried out on the C2v model of the acid maleate ion. The antisymmetric and symmetric O-H-O stretching and O-H-O bending bands were assigned at 2008, 310, and 1700/cm, respectively. The O-H-O stretching and bending force constants used are 1.10 and 0.60 mdyn/A, respectively. Calculations of potential-energy distribution reveal that strong vibrational coupling makes it virtually impossible to assign group frequencies in the low-frequency region. (Author)

AD-616 089 Div. 25/7

General Dynamics/Astronautics, San Diego, Calif.
SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-micron FUNDAMENTAL BAND OF H2O,
by C. B. Ludwig, C. C. Ferriso, and C. N. Abeyta. 10 Sep 64, 11p
Contract Nonr390200, ARPA Order 237
Unclassified report

Pub. in Journal of Quantatative Spectroscopy and Radiative Transfer v5 p281-90 1965 (Copies available only to DDC users).

Descriptors: (*Water vapor, Band spectrum), (*Band spectrum, Intensity), (*Emissivity, Band spectrum), Infrared spectroscopy, High-temperature research.

Spectral emissivities of the v2-fundamental band of water have been measured between 550 and 2200 K. The hot water vapor samples were produced in a small supersonic burner using H2 and O2 gases. The variation of the spectral emissivities of H2O as a function of temperature has been obtained for a constant amoung of H2O in the optical path. An estimate of the integrated intensity of the 6.3-micron fundamental band has been

made from the high temperature emission spectra. The observed integrated intensity of the 6.3-micron H2O band was 300±20 per cent (1/cm sq. atm) at 273 K and is independent of the temperature. (Author)

AD-616 116 Div. 4/4, 25/6
CFSTI Prices: HC$1.25 MF$0.50

Naval Research Lab., Washington, D. C.
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE,
Interim rept.,
by V. R. Deitz. 11 May 65, 42p
Rept. no. NRL-6225
Proj. RR001 01 43 4702

Unclassified report

Descriptors: (*Adsorption, Gases), (*Solids, Surface properties), (*Surface properties, Adsorption), Surface area, Impurities, Monomolecular films, Atomic structure, Nitrogen, Solid state physics, Low-pressure research.

Recent researches of interest to surface chemistry are surveyed. Important current trends in this field are discussed. The material is presented from the point of view of surface coverage.

AD-616 147 Div. 25/7, 4/4, 25/8

Lockheed Missiles and Space Co., Palo Alto, Calif. Research Labs.
SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS,
by D. O. Miles. 22 Oct 62, 1p

Unclassified report

Pub. in Journal of Applied Physics v36 n3 pt1 p866-7 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Halogenated hydrocarbons, Molecular association), (*Polycyllic compounds, Molecular association), (*Molecular association, Thermochemistry), Liquids, Acoustic properties, Viscosity, Frequency, Temperature.

In an earlier paper (J. Appl. Phys. 33:1422, 1962) the temperature dependence of the high-frequency rigidity of pentachlorobiphenyl was displayed. Two experimental values cited by Piccirelli were included, which did not coincide with a smooth extrapolation of the author's data. There is now reason to believe that a mechanism exists which can account for Piccirelli's results. The underlying process thought responsible for the suggested behavior is attributed to the existence of pseudonuclei or vitrons in the liquid.

AD-616 163 Div. 25/7

Ohio State Univ. Research Foundation, Columbus.
NEAR-INFRARED EMISSION SPECTRUM OF NO,
by Eugene F. Horn and Fred P. Dickey. 29 Apr 64, 7p
Contract AF19 604 6150

Unclassified report

Pub. in Journal of Chemical Physics v41 n6 p1614-20 Sep 15 1964(Copies not available to DDC or Clearing-house customers).

Descriptors: (*Nitrogen compounds, Monoxides), (*Spectra(Infrared), Nitrogen compounds), Infrared spectroscopy, Rotation, Frequency, Atomic energy levels, Band spectrum.

The emission spectrum of the vibration-rotation bands of the electronic ground state of nitric oxide was observed in the 1.83-1.95- and 2.63-2.81-micron regions under moderately high resolution. The source of the spectrum was a high-tension discharge maintained through streaming nitric oxide gas at pressures of less than 1 atm. A detailed analysis of the 2-0, 3-1, and 4-2 bands, occurring at 2.69, 2.73, and 2.77 microns, respectively, has been carried out. Accurate values obtained for many of the rotational and vibrational constants associated with the (2)II sub 1/2 and (2)II sub 3/2 substates of the electronic ground state are presented, including a value for the spin-orbit coupling constant A. Also, the effective rotational temperature of the emitting gas was determined. (Author)

AD-616 187 Div. 4/4, 4/3

Minnesota Univ., Minneapolis. School of Chemistry.
THE EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL COMPONENT,
by Maurice M. Kreevoy and Margaret A. Turner.
3 Sep 64, 3p
Grant AF AFOSR16 63, Proj. 9763, Task 976301
AFOSR 65-0686

Unclassified report

Pub. in Journal of Organic Chemistry v30 p373-5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Metalorganic compounds, Decomposition), (*Mercury compounds, Decomposition), (*Alcohols, Decomposition), (*Decomposition, Reaction kinetics), Iodides, Molecular structure, Acids, Spectroscopy, Thermochemistry, Enthalpy, Entropy, Chemical bonds, Stereochemistry.

The aqueous acid induced deoxymercuration rates of 14 oxymercurials, ROCH2CH2HgI, have been measured and combined with two previously available. The rates cover a range of a factor of over 20. No over-all correlation with the Taft inductive parameter is obtained, but a very limited correlation suggests a rho* value of about -1.4. Steric factors and possibilities for internal hydrogen bonding also seem to influence the rates. (Author)

AD-616 188 Div. 4/3

Newcastle upon Tyne Univ. (England).
HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
by N. N. Greenwood, J. H. Morris and J. C. Wright.
16 Dec 63, 9p
Grant AF EOAR62 27
AFOSR 65-0691

Unclassified report

Pub. in Journal of the Chemical Society n917 p4753-61 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Organoboranes, Synthesis(Chemistry)), (*N-heterocyclic compounds, Organoboranes), Polycyclic compounds, Heterocyclic compounds, Hydrolysis, Spectra(Infrared), Nuclear magnetic resonance, Great Britain.

Hydroboronation of the three double bonds in triallylamine yields a tricyclic compound with bridgehead nitrogen and boron atoms and a direct B-N bond; it is an unreactive, volatile solid which hydrolyses slowly to dipropylaminopropylboronic acid and tripropylamine. Hydroboronation of triallylborane yields the analogous

bicyclic dibora-compound which is highly reactive and forms adducts with nitrogen donors. The infrared spectrum of azaboratricycloundecane is compared with those of triethanolamine borate and trisethyleneglycol diborate, and its boron and proton n.m.r. spectra are also elucidated. (Author)

AD-616 189 Div. 25/7, 20/2

Columbia Radiation Lab., New York.
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. I. X RAYS AND NEUTRONS,
by William A. Steele and R. Pecora. 27 Oct 64, 9p
Grants DA ARO D31 124G380, NSF GP438
AROD 3922:10

Unclassified report

Pub. in Journal of Chemical Physics v42 n6 p1863-71 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*X rays, Scattering), (*Thermal neutrons, Scattering), (*Molecules, Scattering), (*Statistical mechanics, Scattering), Liquids, Elastic scattering, Inelastic scattering, Probability.

The general theory of the statistical mechanics of nonspherical molecules is applied to the problem of the scattering of x rays and slow neutrons from a fluid composed of nonspherical molecules. Expressions for the differential scattering cross sections are derived for the cases of both elastic and inelastic scattering. General properties of the time-dependent correlation functions are discussed, and a short-time approximation is given and applied to the calculation of the inelastic neutron scattering cross section. (Author)

AD-616 190 Div. 25/7, 25/4

Columbia Radiation Lab., New York.
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. II. LIGHT,
by R. Pecora and William A. Steele. 27 Oct 64, 8p
Grants DA ARO D31 124G380, NSF GP438
AROD 3922:11

Unclassified report

Pub. in Journal of Chemical Physics v42 n6 p1872-9 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Light, Scattering), (*Molecules, Scattering), (*Statistical mechanics, Scattering), Liquids, Optical properties, Elastic scattering, Inelastic scattering, Intensity, Moments.

The statistical mechanical theory of nonspherical molecules is applied to the problem of the scattering of light from fluids composed of optically nonspherical molecules. Expressions for the scattered light intensity in the elastic and inelastic scattering cases are expressed in terms of angular moments of the generalized pair distribution function of the fluid. The special case of axial symmetry is considered, and comparison with previous theoretical and experimental work is briefly made. (Author)

AD-616 211 Div. 4/2

Syracuse Univ., N. Y.
MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES,
by W. A. Baker and A. R. Janus. 23 Dec 63, 12p
Grant AF AFOSR62 213, Proj. 9761, Task 976103
AFOSR 65-0799

Unclassified report

Pub. in Journal of Inorganic and Nuclear Chemistry v26 p2087-97 1964 (Copies available only to DDC users).

Descriptors: (*Zirconium compounds, Iodides), (*Hafnium compounds, Iodides), (*Magnetic properties, Hafnium compounds), Diffraction analysis, X-ray diffraction analysis, Absorption spectrum, Temperature, Ferromagnetism.

Zirconium triiodide and hafnium triiodide were prepared by aluminum reductions of the corresponding tetrahalides. Green and black species of both compounds were isolated. The magnetic susceptibilities of these compounds were measured over the temperature range 100°-300 K by the Gouy method. A correlation of observed magnetic and structural properties is given in terms of competing ferromagnetic and antiferromagnetic interactions in the lattice. The visible absorption spectrum was measured for species obtained on dissolution of zirconium triiodide in water. Absorption bands were assigned for what is proposed to be the hexaquozirconium ion and a less stable iodinated species of the aquozirconium ion. (Author)

AD-616 218 Div. 25/7, 30/3

Washington Univ., St. Louis, Mo. Dept. of Physics.
DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM,
by Jonathan F. Reichert and Jonathan Townsend.
27 Aug 64, 7p
Grant AF AFOSR62 412, Proj. 9751, Task 975102
AFOSR 65-0813

Unclassified report

Pub. in The Physical Review v137 n2A pA476-82 Jan 18 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sodium, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Spectrum analyzers), (*Spectrum analyzers, Nuclear magnetic resonance), Nuclear spin, Relaxation time, Electrons, Nuclei, Polarization, Differential equations, Induction heating, Cavity resonators.

A double-resonance spectrometer was constructed capable of making accurate measurements of all the dynamical variables expressed in the master equation governing the time evolution of the dynamic nuclear enhancement of a single sodium sample. TThis system could measure the rate of rise of the nuclear polarization after the onset of saturation, the rate of decay of the polarization after the saturation was removed, and the nuclear T1 by the standard 180-90 degree pulse method. It was found that each of these processes had the same time constant T1 = 13.2 ± 0.2 msec within experimental error, in agreement with theory. The steady-state enhancement as a function of electron saturation gave a value of the leakage coefficient f to be 0.88 ± 0.05 at 29C. The values of T1 and f enable one to calculate T1e, i.e., the spin-lattice relaxation time due to the conduction-electron-nuclear contact interaction, to be 14.9 ± 0.8 msec. These data demonstrate that the electron-nuclear contact interaction is the dominant mode of nuclear relaxation for sodium at room temperature. (Author)

AD-616 225 Div. 25/7, 25/5

Maryland Univ., College Park.
AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL,
by Francis J. Smith and R. J. Munn. 17 Aug 64, 9p
Unclassified report

Pub. in Journal of Chemical Physics v41 n11 p3560-8 Dec 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gases, Transport properties), (*Atoms, Transport properties), (*Molecules, Transport properties), (*Transport properties, Programming(Computers)), Integrals, Quantum statistics, Kinetic theory, Potential theory, Probability, Tables.

A computer program is described for calculating the classical and quantal JWKB Chapman-Enskog collision integrals for any reasonable interaction potential. With the program it was possible in about 10 or 15 min on a fast computer to calculate more than 500 collision integrals covering a complete range of values of l, s, and T to an accuracy of better than 1 part in 1000. This was made possible by the use of efficient numerical techniques such as weighted Gaussian quadratures and by the general optimization of all numerical and logical processes. The program was checked against previous tables for the Lennard-Jones and Stockmayer potentials. It was also used to list values of the collision integrals and Kihara's corrections to the coefficients of viscosity, thermal conductivity, diffusion and thermal diffusion for the Morse potential. (Author)

AD-616 238 Div. 4/4
CFSTI Prices: HC$1.00 MF$0.50

Naval Research Lab., Washington, D. C.
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
Interim rept.,
by N. L. Jarvis. 5 May 65, 19p
Rept. no. NRL-6250
Proj. RUDC4B000 652 1F101 99 01
Unclassified report

Descriptors: (*Monomolecular films, Viscosity), (*Amides, Monomolecular films), (*Amines, Monomolecular films), (*Alcohols, Monomolecular films), (*Carboxylic acids, Monomolecular films), Surface properties, Pressure, pH, Shear stresses.

The surface viscosities of monomolecular films of 14-, 16-, and 18-carbon aliphatic alcohols, amines, acids, and amides were determined from the rate of flow of the film material through a narrow and relatively deep viscometer canal. The surface viscosities were measured as functions of film pressure, substrate pH, and the rate of flow of the film. The surface viscosity data for alcohols and acids were in good agreement with those previously reported viscosity values also determined by the canal technique. The values determined with a canal viscometer are often an order of magnitude less than those obtained with other types of viscometers. There are no corresponding data available in the literature with which to compare the surface viscosities of the amide and amine monolayers. Experiments were also carried out for distinguishing between Newtonian and non-Newtonian behavior in the monolayers. (Author)

AD-616 335 Div. 4/4, 4/2, 2/7
CFSTI Prices: HC$2.00 MF$0.50

Electro-Dynamics Labs., Utah State Univ., Logan
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
Final rept.,
by William M. Moore, John P. Kennealy, and Doran J. Baker. 1 Jan 65, 46p
Contract AF19 628 3821, ARPA Order 111
AFCRL 65-291 Unclassified report

See also AD-609 281.

Descriptors: (*Chemical reactions, Reaction kinetics), (*Oxygen, Chemical reactions), (*Nitrogen, Chemical reactions), (*Luminescence, Infrared spectroscopy), Transport properties, Energy, Nitrogen compounds, Oxides, Geophysics, Upper atmosphere, Temperature, Emissivity, Spectrum analysers.

Chemical reactions involving active nitrogen and oxides of nitrogen have been studied with the relatively new technique of infrared chemiluminescence. Spectra have been obtained and presented of the N + NO reaction from 1 to 6 microns. First overtone emissions of nitric oxide at 2.7 microns have been obtained from the reaction of N + NO2 and the intensity variations studied as a function of NO2 concentration. Equilibrium between the vibrational and rotational modes has not been achieved. The rotational temperature is only several hundred degrees, whereas the vibrational temperature is several thousand degrees. This reaction shows similarities to the H + C12 reaction studied by Polanyi (Quant. Spect. Rad. Trf. 3:471 (1963) and Proc. Roy. Soc. A258:529 (1960)). In addition to energy transfer information, this reaction shows that infrared chemiluminescence can yield valuable information about the mechanism of complex chemical reactions. (Author)

AD-616 337 Div. 4/3, 16/11, 4/4
CFSTI Prices: HC$1.00 MF$0.50

Redstone Scientific Information Center, Redstone Arsenal, Ala.
THE STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES,
by Joseph Parello, Pierre Longevialle, Walter Vetter, and James A. McCloskey. May 65, 20p RSIC-411
TT 65-62458 Unclassified report

Trans of Societe Chimique de France. Bulletin, n12 p2787-93 Dec 1963.

Descriptors: (*Tropane alkaloids, Molecular structure), (*Nuclear magnetic resonance, Tropane alkaloids), (*Mass spectroscopy, Tropane alkaloids), Alcohols, Spectroscopy, Chemical analysis, France.

Phyllalbine is the vanillic ester of tropanol. The chemical determination of this structure is completed by a study of some tropanol and pseudotropanol derivatives by means of magnetic nuclear resonance (RMN) and mass spectrometry. (Author)

08. Earth Sciences and Oceanography

AD-615 787 Div. 2/9
CFSTI Prices: HC$1.00 MF$0.50

Chicago Univ., Ill. Fluid Dynamics and Sediment Transport Lab.
THE ANGLE OF REPOSE OF A SINGLE GRAIN ON A FIXED ROUGH BED,
by R. L. Miller and R. J. Byrne. May 65, 21p
Technical rept. no. TR-4
Contract Nonr212126

Unclassified report

Descriptors: (*Sand, Statics), Particles, Particle size, Deserts, Beaches, Motion, Sedimentation, Geometric forms, Spheres, Transport properties, Fluid flow, Electrostatics, Reviews.

AD-615 790 Div. 2/9
CFSTI Prices: HC$3.00 MF$0.75

Army Coastal Engineering Research Center, Washington, D. C.
EXPERIMENTAL STUDY OF LONGSHORE CURRENTS ON A PLANE BEACH,
by C. J. Galvin, Jr. and P. S. Eagleson. Jan 65, 88p Technical memo. no. TM-10

Unclassified report

Descriptors: (*Beaches, Experimental data), Transport properties, Sedimentation, Hydrodynamics, Breakwaters, Ocean currents.

This investigation deals with experimental description of longshore currents and analytical prediction of longshore current velocity. The experimental phase includes measurements, under controlled laboratory conditions, of phenomena associated with longshore currents flowing on a smooth plane beach. The analytical phase includes development of an empirical relation between longshore current velocity and wave conditions at breaking, an order-of-magnitude analysis of energy in the surf zone, and an examination of equations of motion for longshore currents. The empirical relation for predicting approximate value of mean velocity of uniform longshore currents agrees with some sets of field and laboratory data. (Author)

AD-615 833 Div. 2/10

Lamont Geological Observatory, Palisades, N. Y.
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS,
by Lynn R. Sykes and Mark Landisman. 20 Jul 64, 18p Scientific rept. no. SR-40, LGO-759
Contract AF19 604 7376, Proj. 8652, ARPA Order 292, Task 865203
AFCRL 65-148

Unclassified report

Pub. in Bulletin of the Seismological Society of America v54 n6 p1927-1940 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earthquakes, Africa), (*Africa, Earthquakes), Seismology, Red Sea, Maps, Tables.

Maps of earthquake epicenters are presented for East Africa, the Gulf of Aden and the Arabian and Red Seas for the period January 1955 to March 1964. In the Gulf of Aden and in the Arabian Sea, the epicenters are confined to narrow linear segments. A large fracture zone that intersects the mid-oceanic ridge near 58E is clearly delineated with the new epicenters. In the Gulf of Aden regions of high seismic activity are found where NNE-SSW trending faults intersect the median ridge. A large number of the earthquakes in East Africa are associated with various branches of the rift system. However, many well-recorded earthquakes were not located along the rift valleys. The large areal extent of seismic activity in East Africa differs from the narrow linear pattern of activity that is associated with the mid-oceanic ridge. (Author)

AD-615 834 Div. 2/10

Lamont Geological Observatory, Palisades, N. Y.
SEISMIC WAVES WITH FREQUENCIES FROM 1 to 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY,
by Bryan Isacks and Jack Oliver. 20 Jul 64, 44p
Scientific rept. no. SR-39, LGO-758
Contract AF19 604 7376; Grant NSF G16034, Proj. 8652, ARPA Order 292, Task 865203
AFCRL 65-147

Unclassified report

Pub. in Bulletin of the Seismological Society of America v54 n6 p1941-79 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismic waves, New Jersey), Seismographs, Earthquakes, High frequency, Background, Noise.

A vertical component seismograph with a magnification of about 8 million at 20 cps was operated 1780 feet below the surface at the Sterling mine of the New Jersey Zinc Company in Ogdensburg, New Jersey. Background noise, local earthquakes and teleseismic body phases were recorded. For frequencies greater than 2 cps, the continuous part of the background noise was fairly stationary during nighttime recording intervals. During 730 hours of recording at quiet background noise levels, 8 local earthquakes were detected. Six local shocks were recorded during an additional 2160 hours by conventional short period instrumentation located at Ogdensburg and Sterling Forest, New York. These data, combined with historical data on the occurrence of 22 larger shocks local to the area, are consistent with a linear relation between the logarithm of earthquake number and magnitude. The seismicity of the area, which lies within a region of Paleozoic and early Mesozoic diastrophism, is about 2 orders of magnitude less than that of Southern California, 3 orders of magnitude less than that of the Garm region in Central Asia, and 4 orders of magnitude less than that of the Kwanto region in Japan. Phases from 18 distant earthquakes were recorded by the high gain instrument. (Author)

AD-615 838 Div. 2/10, 2/5

Saint Louis Univ., Mo.
TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE,
by John Dowling and Otto Nuttli. 20 Jul 64, 21p
Scientific rept. no. SR-6, Pub-127
Contract AF19 604 7399, Proj. 8652, ARPA Order 180-61, Task 865201
AFCRL 65-142

Unclassified report

Pub. in Bull. of the Seismological Society of America v54 n6 p1981-96 Dec 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismic waves, Velocity), (*Earth models, Seismology), Structural geology, Wave transmission, Time, Least squares method, Nuclear explosions, United States.

Velocities within the earth can be determined from body wave time-distance (T-D) data by the Herglotz-Wiechert method provided the velocity does not decrease too rapidly with depth. Until the present time, the properties of T-D curves for rapid decreases of velocity with depth have been considered only qualitatively. This paper presents a technique for calculating a T-D curve for any velocity distribution, including continuous and discontinuous increases and decreases of velocity with depth. Some properties of T-D curves are quantitatively studied by systematically varying the characteristics of a single model and noting the corresponding variations in the calculated T-D curves. From this it is concluded that a significant low-velocity channel may not be evidenced by a shadow zone but rather by an overlapping of two distinct branches of the T-D curve. It is further concluded that the presence of a shadow zone implies a very gentle velocity gradient below the low-velocity channel. By fitting a calculated T-D curve to observed data one can determine velocity as a function of depth even when the velocity decreases rapidly with depth, when a low-velocity channel exists. Observed T-D data for two underground nuclear explosions (GNOME and BILBY) measured in four different azimuths were fitted with T-D curves calculated for assumed velocity distributions. (Author)

AD-615 839 Div. 2/10, 2/5

Saint Louis Univ., Mo.
CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE VELOCITY INVERSION,
by T. V. McEvilly. 20 Jul 64, 24p
Scientific rept. no. SR-7, Pub-128
Contract AF19 604 7399, Proj. 8652, ARPA Order 180 61, Task 865201
AFCRL 65-143

Unclassified report

Pub. in Bull. of the Seismological Society of America v54 n6 p1997-2015 Dec 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Structural geology, United States), Seismology, Anisotropy, Least squares method, Earth models.

Fundamental mode Rayleigh and Love wave phase velocities in the period range 5 to 80 seconds have been measured in the central U. S. Using the concept of constant partial derivatives of phase velocity with respect to layer parameters in a least-squares inversion scheme a structural model for the area was determined. Several parameters were constrained on the basis of other available data. It was not possible to fit satisfactorily both Rayleigh and Love data with a simple isotropic model. Conclusions require either anisotropy in the upper mantle or systematic errors in the phase velocity measurements. (Author)

AD-615 840 Div. 2/10

Saint Louis Univ., Mo.
A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETERMINATION USING S-WAVE DATA,
by Agustin Udias. 16 Jun 64, 16p
Scientific rept. no. SR-8, Pub. 129
Contract AF19 604 7399, Projs. 8652, ARPA Order 180 61, Task 865201
AFCRL 65-144

Unclassified report

Pub. in Bull. of the Seismological Society of America v54 n6 p2037-47 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earthquakes, Data), (*Least squares method, Seismology), Seismic waves, Polarization, Programming (Computers).

In this paper a numerical approach to the determination of focal mechanisms based on the observation of the polarization of the S wave at N stations is presented. Least-square methods are developed for the determination of the orientation of the single and double couple sources. The methods allow a statistical evaluation of the data and of the accuracy of the solutions. (Author)

AD-615 841 Div. 2/10

Saint Louis Univ., Mo.
APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
by Agustin Udias and William Stauder. 6 Jul 64, 22p Scientific rept. no. SR-9; Pub-130
Contract AF19 604 7399, Projs. 8652, ARPA Order 180-61, Task 865201
AFCRL 65-145

Unclassified report

Pub. in Bull. of the Seismological Society of America v54 n6 p2049-65 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earthquakes, USSR), (*Least squares method, Seismology), Seismic waves, Polarization, Structural geology.

The least squares method for the determination of focal mechanism using S-wave data developed by Udias (1964) has been applied to 34 earthquakes of the Kamchatka-Kurile Islands Regions. For most of the earthquakes studied the source mechanism was found to conform best to a double couple model. The accuracy and stability of the solutions are examined. The direction of the principal axes of stress for most of the solutions show a steeply dipping axis of tension and an almost horizontal axis of pressure. The orientation of the pressure axes is normal to the regional trend. The direction of the stresses suggest a thrust faulting with predominantly dip slip motions such that the continental block moves over the oceanic. (Author)

AD-615 842 Div. 2/10, 2/5

Saint Louis Univ., Mo.
AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES,
by W. J. Hannon. 10 Aug 64, 18p
Scientific rept. no. SR-10; Pub-131
Contract AF19 604 7399, Proj. 8652, ARPA Order 180 61, Task 865201
AFCRL 65-146

Unclassified report

Pub. in Bull. of the Seismological Society of America v54 n6 p2067-79 Dec 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earth models, Seismology), (*Seismographs, Synthesis), Seismological stations, Site selection, Matrix algebra, Structural geology, Wave transmission.

The surface motion arising from a plane dilatational wave striking the base of a layered system is obtained by Fourier synthesis using the frequency dependent transmission coefficients which may be computed by the Haskell-Thomson matrix method. Theoretical seismograms illustrating the effect of thin, low-velocity surface layers on the surface motion are constructed from the transmission coefficients of four crustal models. (Author)

AD-615 845 Div. 2/9, 2/5

Scripps Institution of Oceanography, Univ. of California, La Jolla.
DIVING SAUCER DESCENTS INTO SUBMARINE CANYONS,
by Francis P. Shepard. 13 May 65, 8p
Contract Nonr221623, Proj. NR083 005
Unclassified report

Pub. in Transactions of the New York Academy of Sciences v27 (Ser2) n3 p292-7 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Oceanographic vessels, Marine geology), (*Marine geology, Oceanographic vessels), Ocean currents, Erosion, Rock(Geology).

AD-615 867 Div. 2/10
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
STUDYING SHOCK WAVE PROPAGATION IN THE SOIL,
by N. Zhubaev. 7 May 65, 16p FTD-TT-64-1387
TT 65-62391
Unclassified report

Unedited rough draft trans. of Akademiya Nauk Kazakhskoi SSR, Alma Ata. Vestnik v20 n3(228) p47-56 1964.
Available copy will not permit fully legible reproduction.

Descriptors: (*Soils, Shock waves), (*Shock waves, Propagation), Numerical analysis, USSR.

AD-615 877 Div. 2/9, 6/1, 25/1, 30/3
CFSTI Prices: HC$2.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
Final rept. for 15 Dec 53-31 Aug 63,
by J. B. Hersey. Feb 65, 27p Ref-64-52
Contract Nonr136700, Proj. NR281 003
Unclassified report

Descriptors: (*Oceanology, Bibliographies), (*Sonar equipment, Marine geophysics), (*Underwater sound, Sonar equipment), Hydrographic sonar, Underwater equipment, Underwater explosions, Echo ranging, Sedimentation, Sound transmission, Marine geology, Acoustic equipment, Digital computers, Oceanographic vessels.

A program of basic research was instituted and gradually strengthened. This basic research program includes research into oceanographic, submarine geological and geophysical influences on the performance of naval underwater devices, emphasizing those employing underwater sound. Emphasis was placed on the distribution and physical properties of sediment of the deep sea, the structure and motion of the nearly isothermal layer of water near the surface of the sea, the measurement and collation of the velocity of sound as a function of depth and geographic position in the North Atlantic Ocean and the Mediterranean Sea, and the institution of a program of gravity and magnetic measurements together with the use at sea of medium-sized digital computers for recording, collating, and making routine reductions of oceanographic and geophysical observations. (Author)

AD-615 878 Div. 2/9, 24/2, 30/3, 31/9
CFSTI Prices: HC$1.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
NARRATIVE CHAIN CRUISE NO. 38, 5-16 AUGUST 1963,
by John B. Hersey. Mar 65, 20p Ref-65-16
Contracts Nonr402900, Nonr219600,
Projs. NR260 101, NR083 004
Unclassified report

Descriptors: (*Oceanographic vessels, Navigational aids), (*Underwater photography, Oceanographic vessels), Feasibility studies, Radio navigation, Ocean bottom, Submarines, Oceanology, Marine geophysics, Seismology.

CHAIN Cruise 38 was the last of a series of cruises made out of Woods Hole in 1963 for the purpose of investigating the area of the THRESHER sinking. During the twelve days of the cruise a radioacoustic system as a navigational aid was tested and proved feasible, but found in need of further practical development. Fifteen photographic and electric-potential profiles and a few seismic and acoustic measurements of the bottom were made. Only a small amount of debris from THRESHER was photographed. This report contains a narrative of the cruise, tabulations of the seismic and acoustic stations, and a selection of bottom photographs. (Author)

AD-615 998 Div. 2/5
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
PEDO-ECOLOGICAL INVESTIGATIONS, BARROW, ALASKA,
by Jerry Brown and Philip L. Johnson. Apr 65,
44p Technical rept. no. TR-159
Task IV014501B52A31, IV025001A13002
Unclassified report

Descriptors: (*Soils, Alaska), (*Permafrost, Alaska), (*Ecology, Alaska), Climatology, Geological survey, Morphology(Biology), Soil mechanics, Arctic regions, Temperature, Moisture, Morphology(Biology), Plants(Botany), Photographic analysis.

The primary objectives of the study are to quantify the environmental parameters and eco-system processes which are responsible for generating the complex Arctic landscape and to evaluate the effect of micro- and macrorelief upon soils and vegetation. The experimental design and methodologies employed for acquisition and analysis of data are described. Data are presented from 20 plots which include depth of summer thaw for 1962 and 1963, soil moisture content at 80 sample sites, soil chemical concentrations at the 3/4 meter depth, selected soil temperature for an entire year, and lichen, moss, and vascular plant cover. Microclimatic data at 6 stations along a 2-km transect are presented for summer 1963. The interdisciplinary approach to these investigations has been directed towards an understanding of the edaphic, geomorphic, botanical, and ecological characteristics of the landscape, and to a lesser extent to their interactions with the microenvironment. (Author)

AD-616 016 Div. 2/5, 2/10

Instituto Geografico y Catastral, Madrid (Spain).
CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION,
by Gonzalo Payo. 18 Aug 64. 25p
Contract AF61 052 657
Unclassified report

Pub. in Annali di Geofisica (Italy) v17 n4 p523-45 1964(Copies available only to DDC users).

Descriptors: (*Seismology, Spain), (*Structural geology, Spain), (*Spain, Structural geology), Earthquakes, Seismographs, Seismological stations, Seismic waves, Propagation, Velocity, Geophysics, Least squares method, Graphics, Tables.

A large collection of seismograms from near earthquakes recorded at Toledo Observatory nave been revised in order to get the caracteristics of the crustal phases for the Iberian Peninsula Region. After a careful determination of the parameters of the earthquakes, by using all the Spanish Seismological Stations, 39 of them have been selected and grouped in three characteristic groups corresponding to the regions named Algeria, Alboran Sea and rest of the Peninsula, which have been studied comparatively.

AD-616 019 Div. 2/5, 22/1, 22/6

Naval Ordnance Test Station, China Lake, Calif.
CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH,
by Carl F. Austin and J. Kenneth Pringle. Nov 64, 17p NOTS-TP-3685
Task RMMO42 004 216 1F008 08 06
NAVWEPS 8644
Unclassified report

Rept. includes: Detailed Response of Some Rock Targets to Jets from Lined-Cavity Shaped Charges. Pub. in Journal of Petroleum Technology p41-9 Jan 1964, and Use of Shaped Charges in Mining. Pub. in Mining Congress Journal Jul 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shaped charge jets, Penetration), (*Rock(Geology), Penetration), Shaped charges, Cavity liners, Targets, Brittleness, Limestone, Compressive properties, Cratering, Soil mechanics, Soils, Loading(Mechanics), Density, Fracture-(Mechanics).

Research was undertaken on the investigation of rock masses subjected to jet attack from lined-cavity shaped charges. The detailed testing of rock response was carried out in air using dry bulk targets of sufficient size to preclude gross target fracturing during penetration. Overcoring methods were then used to remove the penetration area to permit sectioning and studying the hole walls. During these tests two distinct modes of penetration wall response were observed. One mode is well illustrated by coarse-grained silicate rocks which yield penetrations with severe adjacent grain damage plus significant compaction and stored energy, which is slowly released by failure of the hole walls. The second mode is illustrated by limestone, which gives virtually no megascopic damage adjacent to the hole, and which is stable following penetration. Under proper conditions, however, the limestone samples consistently yield liner-metal and liner-metal-oxide filled fractures adjacent to the penetration. Tests were also performed which permitted evaluation of the effect of gross target fracturing during penetration, and evaluation of the concept of rock density as a criterion of penetration depth. (Author)

AD-616 041 Div. 2/8, 4/2, 8/3

Lincoln Lab., Mass. Inst. of Tech., Lexington.
MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS,
by K. Dwight, N. Menyuk, D. B. Rogers, and A. Wold. 1964, 4p
Unclassified report

Pub. in Oxides and Compounds II p538-41
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spinels, Magnetic properties), (*Vanadium compounds, Magnetic properties), Neutron diffraction analysis, Manganese compounds, Cobalt compounds, Oxides.

The magnetic properties of the normal cubic spinels MnV2O4 and CoV2O4 are investigated by neutron diffraction techniques. The magnetic diffraction pattern obtained from MnV2O4 suggests a Yafet-Kittel canting of the ionic moments, which are found to have the values of 4.5 and 1.2 microns sub B for the manganese and vanadium ions, respectively. These results are in reasonable agreement with Plumier's findings. The diffraction pattern from CoV2O4 suggests a Neel configuration with moments of 2.9 and 0.8 microns sub B for the cobalt and vanadium ions, respectively. However, indications of a high-field magnetic susceptibility require that alternative models be considered. It is shown that reasonable agreement with our data can be obtained on the basis of at least two special arrangements of canted moments. By virtue of recent theoretical developments, these experimental results show that neither MnV2O4 nor CoV2O4 can be adequately described by the nearest-neighbour Heisenberg approximation. This effect is attributed to the importance of orbital degeneracy and spin-orbit coupling in connection with the V3+ ions. Some other consequences of these additional factors are considered. (Author)

AD-616 087 Div. 2/10, 2/5, 2/9

Woods Hole Oceanographic Institution, Mass.
IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER,
by David D. Caulfield, Hartley Hoskins, and Richard T. Nowak. 1 May 64, 6p
Contract Nonr402900; Grant NSF GP2370
Unclassified report

Pub. in Geophysics v30 n1 p133-8 Feb 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Marine geology, Seismic waves), (*Seismic waves, Marine geology), Instrumentation, Seismographs, Structural geology, Marine geophysics.

The continuous seismic profiling system used at the Woods Hole Oceanographic Institution now has (1) an electrical spark sound source which has a maximum stored energy of 100,000 joules and can produce a variety of acoustic pulses with peak pressures of up to 134 db above 1 dyne/sq cm, at a repetition period of 10 sec, and which has a conversion efficiency (stored electrical energy to sound energy radiated) of 10 percent, (2) a streamlined and uniformly neutrally buoyant line-hydrophone array with a band-pass of 20 to 1,000 cps, and (3) a matched-filter detector that measures the correlation between the reflected signal and the waveform incident on the sea floor in the same frequency range as the reflection. A source whose sonic output can be varied readily makes possible tailoring the resolution of the system for the best display of features of the oceanic crust of varying vertical size. A large reduction in the self-noise of the detector is achieved through the use of streamlined, stable-towing, line-hydrophone arrays which also discriminate against the noises of the towing vessel.

A matched-filter detector gives the maximum signal-to-noise ratio obtainable from a linear filter, and an eight-fold improvement over the rectified amplitude presentation formerly used has been obtained. Reflections from 0.8 sec beneath the sea floor in continental shelf areas have been obtained at ship speeds of eleven knots and from 1.8 sec beneath the sea floor in the deep sea at six knots. (Author)

AD-616 093 Div. 2/5, 2/10
CFSTI Prices: HC$1.00 MF$0.50

Durham Univ. (England). Dept. of Geology.
CRUSTAL STRUCTURE OF GREAT BRITAIN,
by M. H. P. Bott and A. L. Lucas. 2 Feb 65, 16p
Scientific rept. no. SR-3
Contract AF61 052 733

Unclassified report

Descriptors: (*Structural geology, Great Britain), (*Great Britain, Structural geology), (*Seismology, Great Britain), Geological survey, Seismic waves, Propagation, Electronic recording systems, Portable, Digital systems, Stratigraphy, Granite, Rock(Geology), Underground explosions.

The report describes the progress made in constructing a transportable seismic array system for use in crustal studies. A review of published work relating to the research aims of this project is included. (Author)

AD-616 114 Div. 2/5
CFSTI Prices: HC$1.00 MF$0.50

Emmanuel Coll., Boston Mass. Research Language Center.
ACTA GEOPHYSICA SINICA, VOL. 12, NO. 2, 1963: TABLE OF CONTENTS AND ABSTRACT,
Tr. by N. H. Ng. Jun 65, 10p
E-TC-Ch-64-21
Contract AF19 628 3869
TT 65-62423

Unclassified report

Abstract trans. of Ti Ch'iu Wu Li Hsueh Pao (Chinese People's Republic) v12 n2 p1-96 1963.

Descriptors: (*Geophysics, Reviews), Charged particles, Magnetic fields, Solar radiation, Meteorology, Nuclei, Seismic waves, Radioactivation analysis, Earthquakes, Well logging, China, Abstracting.

Contents: The allowed regions of charged particles moving in a magnetic field and their model experiment
The influence of solar activity on the duration of large-scale weather processes over Eurasia during the winter half-year
Several problems on the nature of atomic nuclei in earth science
The phase velocities of Rayleigh waves in China
The dynamic properties of high-frequency seismic reflected waves propagated in real media with a fault
A study of the artificial activation method for analyzing the radioactive isotopes Cu(66), Al(28) and Mn(56) in a well
The kinematic and dynamic properties of the return points of reflected waves
Theory of the dimensions of an earthquake source
Derivation of a formula for the differential side geometric factor in designing a coil system for induction logging.

AD-616 141 Div. 2/5, 2/9

Coastal Studies Inst., Louisiana State Univ., Baton Rouge.
BEACH PROCESS STUDIES, PART B, BEACH CUSPS,
by Richard J. Russell and William G. McIntire.
11 May 64, 22p Technical rept. no. TR-23, pt. b
Contract Nonr157503, Proj. NR388 002

Unclassified report

Pub. in Geological Society of America Bulletin v76 p307-20 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Beaches, Structural geology), (*Structural geology, Beaches), Seacoast, Ocean waves, Ocean currents, Erosion, Sand, Gravel, Rock(Geology), Sedimentation, Oceanology.

Beach cusps develop along seaward faces of growing berms. They appear early in the transitional period of decreasing wave energy from winter-to summer-beach conditions. Growth stages are described and related to currents within the swash zone. Cusp spacing depends on coastal exposure and state of the sea. Conditions under which cusps disappear are described. Although most steps in the depositional development and erosional removal of cusps are understood, the theory of their origin will remain incomplete until the reasons for their spacing are known in quantitative terms. (Author)

AD-616 160 Div. 2/10, 2/5

Utah Univ., Salt Lake City.
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES,
by John K. Costain, Kenneth L. Cook, and S. T. Algermissen. 28 Mar 63, 36p
Contract AF19 628 201

Unclassified report

Pub. in Seismological Society of America. Bulletin v53 n5 p1039-74 Oct 1963(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismic waves, Geology), (*Geology, Seismic waves), Structural geology, Seismographs, Underground explosions, Nuclear explosions.

Energy ratios from Knott's energy equation and amplitude ratios and phase angles from the Zoeppritz equations were calculated for a plane SV wave incident on a plane elastic discontinuity. All computations were programmed in FORTRAN for an IBM 1620 digital computer. Incident angles were varied from 0 to 90 degrees in increments of two degrees except near the critical angles, where the ratios were calculated in increments of 0.25 degree generally. Both real and imaginary coefficients were considered in the calculations. The varying parameters were the velocity ratio and density ratio across each interface, and the angle of incidence. Poisson's ratio was kept constant at 0.25. Compressional velocity ratios (transmitted/incident) of 0.7, 0.8, and 0.9, and density ratios (transmitted/incident) of 0.7, 0.8, 0.9 and 1.0 were used. The data are presented in an integrated album which consists of a total of 144 curves (48 curves for each of the 3 characteristics studied). The theoretical amplitudes of PS converted waves, which are seismic body waves resulting from the conversion of an incident parent P wave at a boundary within the earth's crust to a refracted vertically polarized SV wave, were computed (using a FORTRAN program on an IBM 1620 digital computer) for several multi-layered hypothetical and actual crustal models. Preliminary results indicate that the amplitudes of successive PS converted waves arriving from successively deeper layers will continually increase provided that the velocity ratios (upper medium/lower medium) continually decrease with depth. (Author)

AD-616 166 Div. 2/8

Lamont Geological Observatory, Palisades, N. Y.
THE RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
Revised ed.,
by Orson L. Anderson and Edward Schreiber. 1 Dec 64, 9p
Contract AF49 638 1355

Unclassified report

Pub. in Journal of Geophysical Research v70 n6 p1463-71 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 26 Jun 64.

Descriptors: (*Minerals, Density), (*Refractive index, Minerals), Geophysics, Physical properties, Earth, Oxides, Molecular weight, Silicon compounds, Magnesium compounds, Aluminum compounds, Sodium compounds, Potassium compounds, Tables.

It is known that the density of many minerals is related to the (average) index of refraction by a linear law called the Gladstone-Dale law. It is shown that this law is generally applicable only to minerals whose anion is oxygen and whose mean molecular weight is close to 21. Another relationship, called Drude's law, which is deduced from classical dielectric theory, fits the data just as well as the empirical linear law. The correlation between density and index includes the minerals arising from various combinations of SiO2, MgO, Al2O3, Na2), and K2O. An implication is that density controls certain physical properties of oxides, independently of composition or crystal class. This is analogous to the rule found by Birch which relates sound velocity to density and holds for the same groups of minerals. (Author)

AD-616 167 Div. 2/5

Lamont Geological Observatory, Palisades, N. Y.
LATTICE DYNAMICS IN GEOPHYSICS,
by Orson L. Anderson. 1964, 12p
Contract AF49 638 1355

Unclassified report

Pub. in Transactions of the New York Academy of Sciences v27 (Ser2) n3 p298-308 Jan 1965 (Copies not available to DDC or Clearinghouse customers).
Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N. J.

Descriptors: (*Geophysics, Physical properties), (*Earth, Physical properties), Mathematical models, Infrared phenomena, Acoustics, Temperature, Specific heat, Thermal expansion, Molecular weight, Density, Elasticity, Crystal lattices, Crystal lattice defects.

An arbitrary but useful way to classify solid physical properties is into the classes of lattice properties or defect properties. In lattice dynamics the word lattice indicates lattice properties and the word dynamics indicates the importance of thermal vibrations of atoms to those properties. These properties are defined in terms of the set of normal vibrational modes, calculated from a model composed of discrete masses connected by springs in a large array. This information is contained in a fundamental diagram, associated with the particular model, called the frequency vs. wave number diagram. A few conclusions emerge from this method which are independent of the numerical values of the density and velocity distribution used. It is clear that the region of the largest uncertainty in physical properties is 400-1000 Km. Here the density distributions from the various models are quite different from each other, and the adiabatic-isothermal correction is large. On the other hand, in the lower mantle, the density distributions converge, the adiabatic-isothermal correction is negligible and the measured velocities change steadily with depth. It is clear that the Debye temperature is insensitive to the density distribution, and can be regarded as known to within five per cent, subject only to drastic revisions in the present estimates of the mean molecular weight of the mantle. (Extracted)

AD-616 168 Div. 2/5, 2/10

Lamont Geological Observatory, Palisades, N. Y.
CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE,
by Orson L. Anderson. 1965, 5p
Contract AF49 638 1355

Unclassified report

Pub. in Journal of Geophysical Research v70 n6 p1457-61 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earth, Density), (*Geophysics, Equations of state), (*Seismic waves, Velocity), Rock(Geology), Thermal expansion, Earth models.

A number of recent articles have indicated that there is a density minimum in the upper mantle. An example is the article by Clark and Ringwood, where the density minimum is based upon petrology. In this paper the conditions for a density minimum are established using the Mie-Gruneisen equation of state. It is shown that for a homogeneous mantle with a positive value of thermal expansivity, the sign of the density gradient is the same as the sign of the S velocity gradient. The conditions for a density minimum in a nonhomogeneous upper mantle are also discussed. (Author)

AD-616 231 Div. 2/5

Coastal Studies Inst., Louisiana State Univ., Baton Rouge.
SOUTHERN HEMISPHERE BEACH ROCK,
by Richard J. Russell and William G. McIntire.
15 Feb 65, 30p Technical rept. no. TR-15 Pt G, Con-65-1
Contract Nonr157503, Proj. NR388 002

Unclassified report

Rept. on Indian Ocean Studies.
Pub. in Geographical Review v55 n1 p17-45 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Rock(Geology), Southern hemisphere), (*Beaches, Rock(Geology)), Geology, Hydrology.

AD-616 243 Div. 2/5, 2/8
CFSTI Prices: HC$5.00 MF$1.25

Air Force Cambridge Research Labs., Bedford, Mass.
GEOLOGY, MINERALOGY, AND HYDROLOGY OF U. S. PLAYAS,
Environmental research papers,
ed. by James T. Neal. Apr 65, 186p
Rept. no. ERP-96, AFCRL-65-266
Proj. 8623, Task 862302

Unclassified report

Descriptors: (*Geophysics, Lakes), Geology, Minerals, Hydrology, Aerial photography, United States.

Playas (dry lake beds), the flat central portions of desert basins, are landforms which have unique properties. Most of those in the U.S. were sites of larger Pleistocene lakes, and are characterized by fine-grained lacustrine silt and clay, with secondary saline, sulfate, and carbonate minerals. The playa surfaces are essentially level, but hydrologic, tectonic, and climatic forces are continually modifying them. A variety of surface features representing a range of influence of the arid environment have been noted; these features are subject to change in response to a changing environment. Playa basins have been studied in the field using the geophysical methods of gravity, seismology, electrical resistivity, and magnetism. This report is a collection of six individual papers discussing the environment and surface features, mineralogy, hydrology, structure, geophysics, and air-photo features of playas. (Author)

AD-616 254 Div. 2/10, 15/1, 15/2, 30/2
CFSTI Prices: HC$3.00 MF$0.75

Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094),
by Stephen M. Simpson, Jr. 31 Mar 65, 86p
Scientific rept. no. SR-10
Contract AF19 604 7378, Proj. 8652,
ARPA Order 180 61, Task 865203
AFCRL 65-306
Unclassified report

Rept. on Proj. Vela-Uniform.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-299 069.

Descriptors: (*Seismology, Programming(Computers)), (*Programming(Computers), Seismology), (*Statistical analysis, Programming(Computers)), (*Geophysics, Programming(Computers)), Programming languages, Magnetic tape, Computers.

MIT Geophysics Program Set II consists of 267 subroutines, written in FORTRAN or in FAP compatible with FORTRAN-II, for the IBM 709, 7090, 7094. They form an interlocking system of individually accessible routines for single and multiple time series analysis (correlation, spectral analysis, prediction, filtering, spectral and correlation factorization, polynomial operations, probability operations) but also include many general utility and administration routines. Comment cards in each symbolic deck give full documentation. Complete copies of the symbolic system are available and require two 800 BPI tapes. (Author)

AD-616 259 Div. 2/6, 25/3
CFSTI Prices: HC$2.00 MF$0.50

Space Sciences Lab., Univ. of California, Berkeley.
A CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD,
by S. H. Ward and D. C. Fraser. 30 Apr 65, 45p
Series no. 6, Issue no. 14
Contract Nonr22289, Proj. NR371 350
Unclassified report

Descriptors: (*Magnetic fields, Inductance), (*Terrestrial magnetism, Mathematical analysis), Geophysics, Polarization, Magnetic properties, Electrical conductance, Spheres, Cylindrical bodies, Structural geology.

A formulation is presented for the conducting permeable sphere and cylinder in an elliptically polarized alternating magnetic field. Graphically displayed are the inducing, induced, and total magnetic fields for various values of the ellipticity and azimuth of the inducing ellipse and for various values of the induction number and permeability pertaining to a sphere and a cylinder. Substantial differences can exist between inducing and resultant ellipses, measured in the horizontal plane, in the vicinity of a conductivity inhomogeneity such as a sphere or a cylinder. Additionally, a polarization ellipse appears in any vertical plane in the vicinity of an inhomogeneity. Since substantial changes are introduced in a measured field ellipse by the presence of an inhomogeneity, these effects must be considered when induction studies of the Crust are made. A notation is made of some of the peculiarities to be expected when applying the magnetic variation, magnetotelluric and AFMAG methods. (Author)

AD-616 261 Div. 2/9, 2/2

Naval Oceanographic Office, Washington, D. C.
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1962.
Annual rept. no. 11.
Apr 65, 173p SP-70(62)
Unclassified report

Available from U. S. Naval Oceanographic Office, Washington, D. C., 20390, HC$2.00, and from CFSTI MF$1.00. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ice, Arctic regions), (*Arctic regions, Ice), (*Navigation charts, Arctic regions), Oceanographic data, Ice islands, Weather forecasting, Communication systems, Maps.

The eleventh annual report summarizes the ice program of the U. S. Naval Oceanographic Office. Although the program principally supported Military Sea Transportation Service supply operations in the eastern Arctic, many allied projects were also included. The ice forecasting and observing program in the North American Arctic has not only provided direct support to sealift operations but has also made possible the accumulation of historical data necessary for effective planning and successful execution of Arctic operations. (Author)

AD-616 262 Div. 2/5

Naval Oceanographic Office, Washington, D. C.
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1961.
Annual rept. no. 10.
Dec 64, 179p Special pub. no. SP-70(61)
Unclassified report

Available from U. S. Naval Oceanographic Office, Washington, D. C. HC$1.85.
Available from CFSTI MF$1.25.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ice, Arctic regions), (*Arctic regions, Ice), Aerial reconnaissance, Operations research, Oceanology.

A summary of NAVOCEANO and Danish ice operations during 1961 is presented. Operational aspects of obtaining and disseminating ice information and the ice forecasting and observing program are discussed. Ice charts

depict observed synoptic ice conditions throughout the year. Locations of oceanographic stations occupied in the polar and subpolar regions are included. (Author)

AD-616 276 Div. 2/9
CFSTI Prices: HC$3.00 MF$0.75

Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
Rept. for Apr-Dec 64,
by R. D. Gaul and R. E. Boykin. 30 Mar 65, 93p
Reference no. Ref-65-8T
Contract Nonr21194, Projs. NR083 036, 286D
Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. See also AD-609 714, AD-609 715.

Descriptors: (*Hydrographic surveying, Mexico Gulf), (*Oceanology, Mexico Gulf), Oceanographic data, Temperature, Salinity, Ocean currents, Ocean bottom topography, Depth finding, Maps, Tables, Graphics.

The report summarizes data collected during periodic hydrographic surveys made in 1964 over the continental shelf and slope of the northeast Gulf of Mexico. The survey region extends from the Mississippi Delta to Cape San Blas (about 200 nautical miles) and offshore to the 1000 fathom depth contour (100 to 110 nautical miles). The surveys serve two primary purposes. One is to provide 'background' information on the physical environment over the shelf to aid in interpretation of phenomena observed in the vicinity of nearshore platforms off Panama City (Gaul, et al., 1963). The second is to study the distribution of physical properties as related to circulation over and outside the shelf.

AD-616 287 Div. 2/9, 24/2
CFSTI Prices: HC$1.00 MF$0.50

Navy Electronics Lab., San Diego, Calif.
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE.
Evaluation rept.,
by L. A. shumaker. 21 Dec 61, 23p Rept. no. NEL-1094
Unclassified report

Descriptors: (*Oceanographic equipment, Lighting systems), (*Oceanographic vessels, Photographic lighting systems), (*Photographic lighting systems, Oceanographic vessels), Photographic equipment, Mercury lamps, Incandescent lamps, Filaments, Colors, Temperature, Oceanology, Ocean bottom, Submarines.

A combination light source and casing was developed, for the bathyscaph TRIESTE, to facilitate observation and photography in the deep-sea environment. The lamp offers reliability, ease of replacement, and adequate areal lighting for visual observations. It is considered an interim equipment pending development of lights that also provide proper color temperature for optimum photographic results. (Author)

AD-616 288 Div. 2/9, 31/9
CFSTI Prices: HC$3.00 MF$0.75

Navy Electronics Lab., San Diego, Calif.
THE BATHYSCAPH TRIESTE TECHNOLOGICAL AND OPERATIONAL ASPECTS, 1958-1961,
by Don Walsh. 27 Jul 62, 73p
Rept. no. NEL-1096
Unclassified report

Descriptors: (*Oceanographic vessels, Instrumentation), (*Ship structural components, Oceanographic vessels), Oceanographic equipment, Diving, Floats, Operation, Personnel.

Operational and technical aspects of the TRIESTE 1958-1961 program and the 1960-1961 reconstruction of the vessel are described in detail. Scientific data obtained are not included. (Author)

AD-616 298 Div. 2/5, 2/10
CFSTI Prices: HC$2.00 MF$0.50

Seismological Lab., Calif. Inst. of Tech., Pasadena.
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES,
by Mansour Niazi and Don L. Anderson. May 65, 33p
Contract AF49 638 1337, ARPA Order 292 63
Unclassified report

Descriptors: (*Structural geology, North America), (*North America, Structural geology), (*Seismology, North America), Seismic waves, Velocity, Seismographs, Earthquakes, Tables.

Variation of the compressional velocity with depth in the C-region of the upper mantle in western North America is studied. Apparent velocities of first arrivals across the Tonto Forest Array in Arizona were determined for about 70 shallow focus earthquakes. The epicenters range from 10 to 30 degrees in distance and are mostly south of the array. The method gives the slope of the travel time curve directly, the parameter required for a velocity-depth determination. For this distance range it is found that although the slope of the P travel time curve decreases substantially with distance, i.e., increasing apparent velocity, the variation is not uniform. Two relatively abrupt changes are observed at distances of about 17 and 24 degrees. These are most readily interpreted as two second order discontinuities in the region of the mantle above 1000 km. Assuming an average crustal structure as derived from seismic refraction measurements and taking the uppermost 200 km of the mantle given by Gutenberg or Jeffreys, various possibilities are explored for the form of variation of the P wave velocity with depth. The discontinuities in the rate of change of velocity with depth which cause the observed breaks in the apparent velocity curve are found to be at depths of about 320 and 640 km. Although no absolute times are required in the method the travel times for the various derived models are computed and compared with standard tables. (Author)

AD-616 303 Div. 2/9
CFSTI Prices: HC$2.00 MF$0.50

Naval Research Lab., Washington, D. C.
A REFRACTIVE TECHNIQUE FOR MEASUREMENT OF WATER WAVE SLOPE.
Interim rept.,
by Kingsley G. Williams. Sep 64, 26p
Memo rept. no. NRL-MR-1568
Proj. RUDC4B000 6521F001 99 01 231 3
Unclassified report

Descriptors: (*Water waves, Measurement), Refraction, Ocean waves, Optical properties, Optical equipment.

A method for study of the slope and radius of curvature spectra of wind-driven water surfaces based on recording

the peregrinations of a beam of light projected vertically upward from beneath the water surface to a horizontal plane is examined. The ratios between receiver height, anticipated wave amplitude and receiver diameter control the accuracy of the method. For a 1 degree accuracy in slope measurement and a 5% accuracy in radius of curvature measurements, the method appears feasible for wave amplitudes of up to four inches. Resolution capability of 1-2 mm is expected. A preliminary model, tested in sheltered water, provided a record which proved amenable to analysis within the limits imposed by design expediencies in the apparatus. Descriptive data is given of the distribution of apparent wave period, mean slope and angular dispersion of wave slope maxima. (Author)

AD-616 358 Div. 2/8, 2/5, 30/2
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Berkeley. Dept. of Geology and Geophysics.
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
Final rept., pt. 1, Jul 63-Dec 64,
by C. S. Gromme. Dec 64, 63p
Contract AF19 628 2386, Proj. 8623, Task 862301
AFCRL 65-83 I Unclassified report

Descriptors: (*Rock(Geology), Magnetic properties), (*Petrology, Magnetism), (*Paleontology, Programming(Computers)), (*Programming(Computers), Paleontology), Programming languages, Magnetometers, Statistical analysis, Digital computers.

This report describes three programs written in Fortran IV for the IBM 7090 and 7094 digital computers. Their purpose is reduction and statistical analysis of remanent magnetization data obtained from oriented rock specimens used in paleomagnetic research. The first program (magnetometer program) computes, for each oriented specimen, the declination, inclination, and intensity of remanent magnetization, using as input the component directions and intensities obtained with an induction ('spinner') magnetometer. An estimate of the precision of angular measurement is also obtained, and in the case of deformed rocks, the magnetization is obtained both in present geographic coordinates and in what may be surmised to have been the original coordinates. The second program (Fisher statistics program) uses the output from the first and calculates the mean magnetization directions of groups of specimens, the appropriate statistical parameters, and the paleomagnetic pole position corresponding to each group. The third program (virtual magnetic pole program) calculates the mean poles from groups of paleomagnetic poles, together with the appropriate statistics for each. (Author)

AD-616 363 Div. 2/5

Illinois Univ., Urbana.
QUANTITATIVE TERRAIN FACTORS AS RELATED TO SOIL PARENT MATERIALS AND THEIR ENGINEERING CLASSIFICATION.
Civil Engineering Studies Soil Mechanics Series rept.,
by Raymond R. Vadnais, Jr. Jun 65, 177p
Rept. no. CES-MS-10 Unclassified report

Doctoral thesis.
Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Terrain, Civil engineering), (*Civil engineering, Terrain), Soil mechanics, Soils.

The principal objective of the study was to determine whether quantitative terrain factors existed which could be used to differentiate soil areas with different engineering characteristics.

AD-616 382 Div. 2/2, 15/1
CFSTI Prices: HC$3.00 MF$0.75

Vanderbilt Univ., Nashville, Tenn.
THE COLOR PROBLEM.
Master's thesis,
by Benjamin Edward Waller, III. May 65, 75p
Unclassified report

Descriptors: (*Maps, Colors), (*Topology, Maps), (*Colors, Maps), Mapping, Algebraic topology, Algebra, Combinatorial analysis, Graphics.

It is known that geographical maps of an area, colored in such a way that any two subdivisions which touch along a boundary have different colors, can be colored without using more than four distinct colors. The color problem is the determination of the number of colors that are necessary and sufficient to color maps embedded in any topological surface. Some results related to the color problem are proved. Conjectures implying the four-color conjecture are developed.

AD-616 392 Div. 2/9
CFSTI Prices: HC$5.00 MF$1.25

Woods Hole Oceanographic Institution, Mass.
NARRATIVE OF CHAIN CRUISE NO. 43, 15 FEBRUARY-21 AUGUST 1964.
Summary rept.,
by S. T. Knott, E. T. Bunce, C. O. Bowin, J. B. Hersey, and R. L. Chase. Feb 65, 187p Ref-65-9
Contract Nonr402900; Grant NSF GP2370,
Proj. NR260 101
Unclassified report

Descriptors: (*Oceanographic data, Analysis), Geology, Geophysics.

On CHAIN Cruise 43, 15 February to 21 August 1964, geophysical and geological observations were made in the North Atlantic Ocean, the Mediterranean and Red Seas, and the Western part of the Indian Ocean, along the track Woods Hole - Ceuta (Spanish Africa) - La Spezia - Port Said - Aden - Victoria (Seychelles Islands) - Port Louis (Mauritius) - Victoria (Seychelles Islands) - Port Said - Beirut - La Spezia - Monaco - Plymouth (England) - Woods Hole. This report contains (1) a narrative of the cruise, (2) a list of stations, (3) statements of the scientific objectives of the cruise, (4) a summary of the geological and geophysical observations, (5) end-of-cruise reports on equipment and some phases of the research program, and (6) a selection of bottom photographs. WHOI Ref. No. 64-51 contains a detailed navigational plot of the entire cruise, including soundings and the locations of other observations. (Author)

AD-616 397 Div. 2/8, 2/5
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Berkeley. Dept. of Geology and Geophysics.
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA: FURTHER RESULTS.
Final rept., part 2, Jul 63-Dec 64,
by C. S. Gromme and R. T. Merrill. Jan 65, 61p
Contract AF19 628 2386, Proj. 8623, Task 862301
AFCRL 65-83 II
Unclassified report

Descriptors: (*Rock(Geology), Magnetic properties), (*Granite, Magnetic properties), (*Terrestrial magnetism, Granite), (*Geology, California), Anisotropy, Minerals, Magnetism.

Additional sampling and re-evaluation of previously rejected data have provided paleomagnetic poles from five new sites in the 85 million-year-old Cretaceous granites of the Sierra Nevada, California. The mean of these five poles and the nine poles previously reported is located at 165 west longitude and 69 north latitude, with the semi-angle of the 95% confidence cone equal to 9.6. This mean paleomagnetic pole differs only slightly from that previously reported for nine sites only, and agrees with two Cretaceous poles from rocks in Quebec; thus it appears to represent a geographic pole as well. There is no systematic distribution of individual virtual poles with respect to their mean. The only ferromagnetic mineral in all these rocks is pure magnetite, which probably accounts for the large observed dispersion of N.R.M. directions and the magnetic instability of many of the specimens. Measurements of susceptibility anisotropy indicate that only about half the dispersion can be caused by random anisotropy and that the observed uniform anisotropy at some sites has not biased the N.R.M. directions significantly. Behavior of the N.R.M. in samples cooled below the 120 K. magnetite transition suggests that the N.R.M. is more like T.R.M. or C.R.M. than like a weak-field short-time I.R.M. (Author)

AD-616 418 Div. 2/6, 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
MAXIMUM TOTAL ENERGY OF THE VAN ALLEN RADIATION BELT,
by A. J. Dessler and E. H. Vestine. 17 Dec 59, 7p Rept. no. P-1860

Unclassified report

Descriptors: (*Van Allen radiation belt, Energy), Harmonic analysis, Terrestrial magnetism.

It is shown that the results of the spherical harmonic analysis of the geomagnetic field place an upper limit on the energy stored in the Van Allen radiation belt.

AD-616 421 Div. 2/6

RAND Corp., Santa Monica, Calif.
THE SURVEY OF THE GEOMAGNETIC FIELD IN SPACE,
by E. H. Vestine. 5 Jan 60, 35p
Rept. no. P-1863-NSF

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale. Supported by NSF and NASA. Presented as a public lecture at the Theoretical Div., Goddard Space Center, Washington, D. C., Dec 7, 1959.

Descriptors: (*Terrestrial magnetism, Surveying), Magnetometers, Airborne, Maps, Space environmental conditions.

09. Electronics and Electrical Engineering

AD-615 763 Div. 30/2, 32/3, 32/9
CFSTI Prices: HC$2.00 MF$0.50

System Development Corp., Santa Monica, Calif.
TEXTIR: A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM.
Technical memo.,
by Jules Farell. 5 May 65, 37p Rept. no. TM-2392
Unclassified report

See also AD-615 720.

Descriptors: (*Information retrieval, Programming(Computers)), (*Programming(Computers), Information retrieval), (*Criminology, Informational retrieval), Language, Police, Subject indexing, Teletype systems, Programming languages.

A set of programs called TEXTIR has been developed as part of a joint Los Angeles Police Department and System Development Corporation experiment and study concerning the computer retrieval of crime data in natural English language. TEXTIR automatically indexes textual data and responds to natural language queries of the indexed text. This report describes the TEXTIR programs and provides preliminary results on the use of TEXTIR on crime data. Its potential use for handling information other than crime data is also suggested. (Author)

AD-615 767 Div. 8/2, 30/3
CFSTI Prices: HC$2.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
THE DTMB MARK I MEASUREMENT SYSTEM FOR CABLE-TOWED BODIES,
by Robert J. Singleton. Apr 65, 42p
Rept. no. 2001
Proj. S F006 03 02, Task 7462
Unclassified report

Descriptors: (*Towed bodies, Hydrodynamics), (*Transducers, Underwater equipment), Submarines, Communication systems, Telemeter systems, Towing cables, Measurement, Pitch(Motion), Roll, Magnetic recording systems, Electric connectors, Stresses, Velocity, Networks, Shipborne, Electronic equipment, Electrical equipment, Instrumentation, Calibration, Analog-to-digital converters.

An electronic system, designated the DTMB Mark I Measurement System, was developed to measure certain hydrodynamic characteristics of cable-towed bodies during steady-towing conditions. The quantities measured are body roll, pitch, and depth, cable tension and angle (at the body and ship), and speed. The accuracy of measurement is limited by the accuracy of the transducers and is generally about one percent of full scale. One unique feature of the system is a remotely controlled electrical-calibration network that permits calibration of the transducers while the system is being towed. A second unique feature is the use of a magnetic-tape recorder in conjunction with electronic counters to perform analog-to-digital conversion. (Author)

AD-615 778 Div. 8/2
CFSTI Prices: HC$2.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
C-BAND RECIPROCAL PHASE SHIFTERS AND AMPLITUDE MODULATORS,
by Frank Reggia. 30 Mar 65, 29p
Rept. no. TR-1284
Projs. DA1C014501831A, 26600
Unclassified report

Descriptors: (*Phase shifters, C band), (*Modulators, C band), Phase modulation, Amplitude modulation, Waveguides, Phase shift, Ferromagnetic materials, Microwave equipment, Electronic switches, Attenuation, Hysteresis, Temperature, Scanning.

The report describes the design and operation of high-speed amplitude and phase modulators in standard rectangular waveguide systems for the 5- to 7-Gc frequency range. These small reciprocal ferrite modulators are generally characterized by low insertion loss, microsecond response time, matched input impedance for all values of amplitude and phase changes, and power handling capability of a few watts cw and kilowatts peak. Amplitude modulation with positive, negative, or nearly zero phase shift, and phase modulation with small amplitude modulation are also characteristic of these waveguide modulators. (Author)

AD-615 803 Div. 8/1
CFSTI Prices: HC$3.00 MF$0.75

Cruft Lab., Harvard Univ., Cambridge, Mass.
THE LONG YAGI-UDA ARRAY,
by Robert J. Mailloux. 30 Mar 65, 72p
Technical rept. no. TR-464
Contract Nonr186632; Grant NSF GP851, Proj. NR371 016
Unclassified report

See also AD-610 988.

Descriptors: (*Yagi antennas, Wave transmission), (*Electromagnetic waves, Propagation), Phased arrays, Dipole antennas, Electromagnetic wave reflections.

The King-Sandler array theory is used to analyze the excitation of a surface wave along a semi-infinite Yagi array, as well as the scattering of such a wave at the end of the array. A method for approximately analyzing the behavior of finite Yagi arrays is presented which involves the matching of two terminal-zone problems for semi-infinite arrays. Before attempting to correlate the new theory with the more rigorous array theory, an experimental study of a twenty-element Yagi array was undertaken, and all results are shown to be accurately predicted by the King-Sandler theory. An extensive set of numerical data is presented to compare wave theory with array theory, and once again the agreement is excellent. Finally, the new theory is shown to predict a certain critical point in the data at which the wave solution ceases to exist. This point is also observed to enter dramatically into the King-Sandler solution, thus providing a final contribution to the evidence which links the wave theory to the accepted King-Sandler theory. (Author)

AD-615 808 Div. 8/2, 25/6
CFSTI Prices: HC$2.00 MF$.50

Texas Instruments, Inc., Dallas.
THIN FILMS FORMED BY ELECTROCHEMICAL REACTIONS.
Quarterly progress rept. no. 6, 1 Dec 64-28 Feb 65,
by Coy D. Orr. 28 Feb 65, 49p
Rept. no. TI-03-65-35
Contract DA36 039AMC02324E, Proj. 1C0 24401A112 04 03
Unclassified report

See also AD-425 358.

Descriptors: (*Integrated circuits, Preparation), (*Films, Sputtering), (*Sputtering, Integrated circuits), (*Tantalum compounds, Sputtering), Oxides, Silicon, Resistance-

(Electrical), Resistors, Capacitors, Dielectric films, Electric connectors, Electrochemistry, Aluminum, Vapor plating, Microminiaturization(Electronics).

Reactively sputtered thin films of tantalum oxide deposited onto thermally oxidized silicon offer a very wide range of sheet resistivities. The application of an external d-c bias to the substrate during sputtering alters sheet resistivity with no change in film thickness. Resistors of 237 ohms/sq changed less than 3% after 1000 hours at +125C and 2.5 watts/sq inch. Reactively sputtered Ta2O5 dielectric films deposited onto aluminum electrodes offer capacitance values from 0.3 to 3.0 pF/sq. mil and d-c breakdown voltages of 60 to 6 volts, respectively. Yields of 64% within ±20% of 0.5 pF/sq. mil and breakdown voltage greater than 18 volts have been demonstrated. Capacitors tested for 1000 hours at +125C and 60% of destructive breakdown voltage changes less than 2% from initial capacitance. (Author)

AD-615 811 Div. 30/2, 15/1
CFSTI Prices: HC$3.00 MF$0.75

Naval Research Lab., Washington, D. C.
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER.
Interim rept.,
by E. A. Stennett, L. S. Bearce, and R. M. Mason.
18 Dec 64, 57p Rept. no. NRL-6106, NAREC-Ref-28
Projs. RF006 02 41 4351, RR003 09 41 5101
Unclassified report

See also AD-615 313.

Descriptors: (*Programming(Computers), Pseudo-random systems), (*Pseudo-random systems, Programming-(Computers), Mathematical programming, Digital computers, Programming languages, Numbers, Numerical methods and procedures, Instruction manuals.

An interpretive programming system has been written for the U. S. Naval Research Laboratory's medium-speed electronic digital computer (NAREC). This system, known as NIP (acronym for NAREC Interpretive Programming system), provides for automatic floating-point computation over the range between 10 to the -1233rd and +1233rd powers in either of two modes. One mode, called extended precision, allows for computational results containing as many as nineteen significant decimal digits. The other (and historically the first) mode, called regular precision, allows for as many as eleven significant decimal digits. Using the same program, it is possible to compute in either mode, which provides a basis for determining the cumulative effect of computational precision on results. This report discusses conventions and defines instructions which are available for writing a program in the NIP language. A brief description of the floating-point system, an example of a program written in extended precision, and a table of instruction execution times are included in the appendixes. (Author)

AD-615 824 Div. 7/3, 8/2
CFSTI Prices: HC$1.00 MF$0.50

Army Missile Command, Redstone Arsenal, Ala.
DESIGN CONSIDERATIONS FOR TRANSMISSION LINES AND PULSE-FORMING NETWORKS,
by Ralph W. Hawkins. 29 Sep 64, 23p
Rept. no. RE-TM-64-7
Unclassified report

Descriptors: (*Transmission lines, Design), (*Pulse generators, Transmission lines), Networks, Transients, Flash lamps, Xenon lamps, Energy.

The lumped-constant analysis of transmission lines is given. Transient voltages and currents in infinite, open circuit, and terminated transmission lines are considered. The use of a transmission line as a pulse generator is discussed. The optimum operating point for xenon flashlamps is studied. Transmission line energy is calculated.

AD-615 826 Div. 8/2
CFSTI Prices: HC$1.00 MF$0.50

Erie Technological Products, Inc., Pa.
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
Quarterly rept. no. 7, 26 Dec 64-26 Mar 65,
by J. E. Schupp. 26 Mar 65, 18p
Contract DA36 039AMC01479E
Unclassified report

See also AD-611 219.

Descriptors: (*Modules(Electronics), Microminiaturization(Electronics)), (*Capacitors, Manufacturing methods), (*Resistors, Manufacturing methods), (*Microminiaturization(Electronics), Modules(Electronics)), Encapsulation, Reliability(Electronics), Tests, Performance(Engineering).

Progress is reported to establish capability to manufacture Resistor-Capacitor Combination Microelements for Micromodules, including actual fabrication and testing of preproduction samples, and accomplishment of production type run to demonstrate mass production techniques and facilities. (Author)

AD-615 827 Div. 8/1, 8/6, 15/1
CFSTI Prices: HC$2.00 MF$0.50

Illinois Univ., Urbana. Engineering Experiment Station.
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY,
by R. Mittra and S. R. Laxpati. Feb 65, 40p
Antenna Lab. rept. no. 65-2, TR-5
Contract AF19 628 3819, Proj. 4600, Task 460004
AFCRL 65-161
Unclassified report

Descriptors: (*Waveguides, Electromagnetic waves), (*Electromagnetic waves, Propagation), (*Boundary value problems, Waveguides), Scattering, Waveguide irises, Waveguide slots, Determinants, Numerical analysis, Complex variables, Harmonic analysis.

An exact formulation of the boundary value problem for an infinite lossless iris loaded periodic waveguide with glide reflection symmetry has been obtained for TM wave propagation. The characteristic equation for the fundamental propagation constant gamma is solved for real as well as complex roots. These solutions are plotted in the form of k-beta diagrams. The effect of variation of certain parameters is studied. On the basis of the periodicity of the solutions for gamma it is demonstrated that the effective period of this structure is half of its translation period. A discussion of the k-beta plots is presented and some comments on the properties of the complex waves in lossless periodic waveguides are included. (Author)

AD-615 829 Div. 8/2, 8/5

Defence Research Telecommunications Establishment, Ottawa (Ontario).
INTERMODULATION ANALYSIS OF A CRYSTAL MIXER,
by A. L. Barry. 31 Aug 64, 2p
Unclassified report

Pub. in Institute of Electrical and Electronics Engineers. Proceedings v53 n2 p168-9 Feb 1965 (Copies

not available to DDC or Clearinghouse customers).

Descriptors: (*Crystal mixers, Modulation), Taylor's series, Resistance (Electrical).

AD-615 868 Div. 8/2, 25/6
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
INVESTIGATING THE EFFECT OF GAMMA-RAYS, X-RAYS AND NEUTRONS ON ELECTRIC PROPERTIES OF CdS-Se AND CdSe-Se RECTIFYING SYSTEMS,
by M. A. Talibi and G. B. Abdulaev.
7 May 65, 5p FTD-TT-64-1389
TT 65-62392
Unclassified report

Unedited rough draft trans. of mono. Fotoelektricheskie i Opticheskie Yavleniya v Poluprovodnikakh (Photoelectric and Optic Phenomena in Semiconductors) Kiev 1959, 1p.

Descriptors: (*Semiconductors, Radiation damage), (*Crystal rectifiers, Photoconductivity), (*Photoconductivity, Crystal rectifiers), (*Cadmium compounds, Photoconductivity), Gamma rays, Light, X-rays, Neutron bombardment, Sulfides, Selenides, Impurities, Selenium, Electrical properties, USSR, Cadmium alloys, Selenium alloys.

The effects of light, gamma rays, x-rays, and neutrons were studied on semiconducting rectifier systems of selenium doped cadmium sulfied and cadmium selenide. The results indicate that quantum energy of radiation is not related to the effects (volt-ampere, volt-ohm, lux-ampere, etc.) produced.

AD-615 869 Div. 30/5, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SYNTHESIS OF AUTOMATIC CONTROL SYSTEMS BY THE METHOD OF SUCCESSIVE APPROXIMATIONS,
by T. A. Khalilov. 28 May 65, 11p
FTD-TT-65-429
TT 65-62393
Unclassified report

Unedited rough draft trans. of Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Izvestiya. Seriya Fiziko-Matematicheskikh i Tekhnicheskikh Nauk n2 p115-9 1964.

Descriptors: (*Control systems, Automatic), (*Synthesis, Control systems), Numerical analysis, Functional analysis, USSR.

The method of successive approximations, as distinguished from all the known undertakings devoted to the synthesis of systems of controlling by the well-known method, is analytical. This method makes it possible to reveal the effect of all the variable parameters together on the position of the roots of the characteristic equation.

AD-615 891 Div. 8/2, 25/6
CFSTI Prices: HC$1.00 MF$0.50

Western Electric Co., Inc., New York.
MICROWAVE SOLID-STATE DEVICES.
Interim rept. no. 8, 1 Jan-31 Mar 62,
by A. E. Bakanowski, J. H. Forster, and J. C. Irvin.
31 May 62, 22p
Contract DA36 039sc85325, Proj. 3A99 21 001 03
Unclassified report

Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N. J. Continuation of Contract DA36 039sc73224, under task 2. See also AD-261 970.

Descriptors: (*Microwave equipment, Diodes(Semiconductor)), (*Diodes(Semiconductor), Microwave equipment), Semiconducting films, Epitaxial growth, Varactor diodes, Capacitance Gallium alloys, Arsenic alloys, Resistance(Electrical), Test methods.

Consideration of first order performance criteria indicate that zero bias cut-off frequencies up to 270 Gc for graded junction varactors (lower values for step junctions), are required for optimum utilization of existing pumps for low noise performance at room temperature. It is concluded that such improvement in gallium arsenide varactors can be made utilizing the epitaxial structure, and that the present film quality is the major limitation on varactor performance. Accurate evaluation of the film characteristics is required for improving the growth process, and methods of evaluation are discussed. It is pointed out that determination of the differential capacitance of a p(+)-n junction formed on the n-type film can in principle be used to determine the net donor concentration in the film at a point determined by the junction bias and it is suggested that a measurement of the differential resistance (determined at 1 Gc) at the same bias point can be used to calculate the resistivity at the same point in the film. Thus the two measurements can be used to obtain values of the net doping and mobility in regions of the film accessible to the sweep-out effect of the biased p(+)-n junction. Some experimental data are given which suggest that excessive concentrations of deep lying recombination centers can result in poor mobility in the films. Temperature variation of capacitance also indicates the presence of such impurities. The use of transmission techniques at 1 Gc to determine the resistance and capitance of varactor diodes is discussed. (Author)

AD-615 898 Div. 8/2, 26/1
CFSTI Prices: HC$2.00 MF$0.50

TRW Semiconductors, Inc., Lawndale, Calif.
PRODUCTION ENGINEERING MEASURE. TRANSISTOR, VHF, SILICON, POWER (25W-100mc).
Quarterly rept. no. 10, 1 Oct-31 Dec 64,
by G. R. Crabbs. 31 Dec 64, 41p
Contract DA36 039SC86733E
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-608 883.

Descriptors: (*Transistors, Manufacturing methods), Silicon, Very high frequency, Radiofrequency power, Transistor amplifiers, Aluminum coatings, Metal coatings, Titanium, Life expectancy, Dies, Microscropes, Industrial equipment.

Improvements were made in the equipment and processes which prepare the transistors for capping. Evaluation of these improvements is now under way. Changes in the coldweld die have proven satisfactory and no other improvements are necessary. Evaluation of the split field microscope has been completed. The device has been assigned a JEDEC number (2N3674) and the package dimensions have been registered. Aluminum metallized units on operational life test showed electrical degradation. Preliminary samples of titanium-aluminum exhibited some improvement in life test performance. More samples are being evaluated. (Author)

AD-615 899 Div. 8/2, 14/2, 26/1
CFSTI Prices: HC$3.00 MF$0.75

Cornell-Dubilier Electronics Div., Federal Pacific

Electric Co., Norwood, Mass.
PEM FOR PRODUCTION OF FLUORINATED BARIUM TITANATE CAPACITORS FOR OPERATION TO 200C.
Final rept. for 27 Apr 61-27 Mar 65,
by Lawrence E. Nordquist. 27 Mar 65, 54p
Contract DA36 039SC85955
Unclassified report

See also AD-609 639.

Descriptors: (*Capacitors, Manufacturing methods), (*Ceramic capacitors, Fluorination), Encapsulation, Discs, Dielectrics, Ceramic coatings, Glass, Specifications, Zirconium compounds, Silicates, Silicone plastics.

All work accomplished during this production engineering measure is described in this report. The work led to the successful production of two different styles of fluorinated ceramic capacitors capable of operating at 200 C. The production effort involved the manufacture of 16,000 capacitors and required the implementation of a fluorination process and encapsulation with special high temperature materials not previously used in military capacitors. The engineering effort resulted in the development of a continuous fluorination process capable of treating 20,000 capacitor discs per eight hour period. In addition, glass coating of the dielectric was established and a dip encapsulant capable of withstanding high temperatures was developed. Complete process specifications with material specifications are included in this report. (Author)

AD-615 943 Div. 30/2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
JOSS: EXPERIENCE WITH AN EXPERIMENTAL COMPUTING SERVICE FOR USERS AT REMOTE TYPEWRITER CONSOLES,
by J. C. Shaw. May 65, 19p
Rept. no. P-3149
Unclassified report

Descriptors: (*Special purpose computers, Data processing systems), (*Data processing systems, Input-output devices), Typewriters, Training, Programming languages, Communication systems, Computer storage devices.

Descriptions are given of the philosophy of the JOSS system, its hardware and software, and experience with its use.

AD-615 958 Div. 8/2, 26/1
CFSTI Prices: HC$1.00 MF$0.50

Linde Div., Union Carbide Corp., Cleveland, Ohio.
PRODUCTION ENGINEERING MEASURE FOR THE IMPROVED RELIABILITY OF SOLID TANTALUM CAPACITORS.
Quarterly progress rept. no. 7, 1 Jan-31 Mar 65,
by H. W. Holland. 31 Mar 65, 15p
Contract DA36 039AMC03624E
Unclassified report

See also AD-612 647.

Descriptors: (*Tantalum capacitors, Manufacturing methods), Reliability(Electronics), Electrolytic capacitors, Life expectancy, Performance(Engineering), Electrical properties, Production, Failure(Mechanics).

The Production Run was completed through the phases of manufacture and accelerated life testing. Samples were tested to determine parametric values (dc leakage, capacitance and dissipation factor), and 100% go-no go testing of all parts to the limits of MIL C-39003 was partially completed. The contract failure rate goal of 0.001% per thousand hours was met. Typical parametric values are: dc leakage - 0.07 microamperes, capacitance - 21.2 microfarads, dissipation factor - 0.7%. (Author)

AD-615 964 Div. 8/2, 25/6
CFSTI Prices: HC$2.00 MF$0.50

Army Electronics Command, Fort Monmouth, N. J.
SUPERCONDUCTIVE TANK CIRCUITS AS NETWORK ELEMENTS,
by Eric Hafner. May 64, 34p
Technical rept. ECOM-2473
Proj. 1P6 22001A058, Task 1F6 22001A058 01
Unclassified report

Descriptors: (*Circuits, Superconductivity), (*Superconductivity, Circuits), Networks, Transmission lines, Oscillators, Quartz, Crystals, Electrical properties, Electrical impedance.

The properties of superconductive tank circuits are examined from a network standpoint. As specific example, the input impedance of a coaxial transmission line which is terminated by a capacitively coupled superconductive tank circuit is analyzed in detail as a function of frequency. The pronounced effect of the transmission line on the overall performance is demonstrated along with techniques to compensate for it. A set of equations is developed which can be used to determine the electrical parameters of the superconductive tank circuit and their variations with operating conditions from oscillator measurements. The design information required to build the test oscillator is also provided. The similarity between superconductive tank circuits and quartz crystal units is taken advantage of to illucidate the significance of some aspects of the analysis. (Author)

AD-615 965 Div. 8/7, 5/5
CFSTI Prices: HC$3.00 MF$0.75

Army Electronics Command, Fort Monmouth, N. J.
MONOCYCLE POSITION MODULATION,
by William A. Huber. Apr 65, 87p
Technical rept. ECOM-2576
Proj. 1A01300A039, Task 1A01300A03900
Unclassified report

Descriptors: (*Pulse modulation, Data transmission systems), (*Data transmission systems, Pulse modulation), Digital systems, Communication theory, Correlators, Synchronization(Electronics), Phase, Modulation.

This report describes a new form of time position modulation designed to obtain an increase in the rate of transmission of binary digital data without extending the bandwidth. The system known as Monocycle Position Modulation (MPM) is described, and its application to the transmission of binary digital data is discussed. An inherent characteristic of the MPM signal is that it contains synchronizing information that has not required additonal time or power to transmit. A method for extracting and using this synchronizing data at the receiver is given. This method uses a novel analog memory for frequency control that has both short time response under dynamic conditions and infinitely long time memory under static conditions. Another desirable characteristic of the memory is its ability to adapt to operational changes. An analysis of the spectral power distribution of a randomly modulated MPM signal is derived and the results interpreted with respect to system performance. The performance obtained during laboratory tests of an experimental MPM system operating directly from a binary digital signal stream at 3,000 bits/second is described. (Author)

AD-615 977 Div. 8/2, 30/5
CFSTI Prices: HC$3.00 MF$0.75

International Resistance Co., Philadelphia, Pa. Documented Reliability Div.
RELIABLE LONG LIFE COMPONENT STUDY XLT METAL FILM RESISTOR.
Final technical rept. for 30 Nov 61-15 Oct 64, by Rodger Blackwell. 15 Oct 64, 87p
Contract DA36 039sc88961, Proj. 1P6 22001A057 01
Unclassified report

Descriptors: (*Resistors, Metal films), (*Reliability (Electronics), Resistors), Life expectancy, Failure (Mechanics), Temperature, Resistance(Electrical), Environmental tests, Mathematical models, Statistical analysis.

The performance of the XLT under the conditions of the test matrix justify the rating of this resistor as a 1/4 watt resistor. The estimated failure rate for 1/4 watt operation at 125C and 85C are 0.0008 and 0.0003 percent per thousand hours, respectively, when a failure is defined as a delta R exceeding ± 2.0 percent. Independent data exists that indicates a selection is possible between high and low performance units at the 1/4 watt level and it is possible to discriminate between the two. The requirement of MIL-R-55182 that the life test sample be evaluated against a limit of 0.25% is prohibitive with respect to XLT's designation as a 1/4 watt resistor and must be modified if the resistor is to be so rated. The temperature coefficient characteristic is constant and does not change within the limits of experience on this matrix test. The XLT is capable of meeting an extended moisture resistance test of 30 cycles.

AD-616 000 Div. 8/2, 25/6
CFSTI Prices: HC$2.00 MF$0.50

General Dynamics/Forth Worth, Tex. Nuclear Aerospace Research Facility.
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
Rept. for 1 Oct 64-1 Apr 65, by B. E. Curtsinger and A. R. Robinson. May 65, 50p Rept. no. FZK-2z4
Contract AF29 601 6643, Proj. 6773, Task 677302
WL TR-65-18
Unclassified report

Descriptors: (*Transistors, Gain), (*Radiation damage, Transistors), Tests, Solar cells, Silicon, Diodes(Semiconductor), Dosimeters, Test equipment, Circuits.

One hundred eighty transistors, four diodes, and two silicon solar cells were irradiated during the week of 7 December 1964. The transistors were irradiated under closely controlled environmental conditions and bias levels. Data were taken on the transistors and diodes before, during, and after the irradiation. The report describes the test setup and techniques and gives the dosimetry data. (Author)

AD-616 004 Div. 30/2
CFSTI Prices: HC$3.00 MF$0.50

Hawaii Inst. of Geophysics, Honolulu.
A DESCRIPTION OF THE FESTSA SYSTEM, by Gordon W. Groves and Harold G. Loomis. Mar 65, 52p Rept. no. HIG-65-7
Contract Nonr374803, Proj. NR083 168
Unclassified report

Descriptors: (*Programming(Computers), Numbers), (*Numbers, Programming(Computers)), Magnetic tape, Numerical methods and procedures.

The user writes a simple main program in FORTRAN consisting of calls to the subroutines needed for his particular computation. These subroutines exist in binary (compiled) form on cards, and not on magnetic tape. It is designed primarily for use on the SCCUH (Statistical and Computing Center, University of Hawaii) IBM 7040, but it could be adapted to any computer having a FORTRAN compiler. Binary decks for the 7040 are available on request.

AD-616 007 Div. 8/2, 20/3
CFSTI Prices: HC$3.00 MF$0.75

IBM Space Guidance Center, Owego, N. Y.
STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION ON ELECTRONIC PARTS AND MATERIALS (SCORRE).
Rept. no. 8 (final), 1 Feb 63-28 Feb 65, by Frank A. Frankovsky. 28 Feb 65, 58p
IBM-65-521-08
Contract DA36 039AMC00161E, Proj. ICO 24401A112, Task ICO 24401A112 05 Unclassified report

Descriptors: (*Radiation damage, Electronic equipment), (*Electronic equipment, Radiation damage), (*Capacitors, Radiation damage), Mica capacitors, Ceramic capacitors, Dielectrics, Nuclear reactors.

This report contains the results of a series of experiments conducted on capacitors of the tantalum oxide, ceramic, mica, and glass dielectric types. The experiments were conducted to provide design information that would characterize the radiation response of the capacitor in terms of the dielectric material and device construction. Included also are the results of a study conducted for Picatinny Arsenal of the behavior of a critical timer circuit in which failure modes and thresholds were determined analytically and confirmed experimentally. The studies utilized pulse reactor radiation and a high-energy electron beam. (Author)

AD-616 091 Div. 8/2, 15/1

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
BOUNDS OF IMPEDANCE FUNCTIONS OF R, ± L, ± C, T NETWORKS, by T. S. Huang and H. B. Lee. 1963, 12p
Contract DA36 039AMC03200E; Grant NSF GP2495
Unclassified report

Pub. in Journal of The Franklin Institute v279 n2 p83-94 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrical impedance, Special functions-(Mathematical)), (*Networks, Electrical impedance), Resistance(Electrical), Inductance, Capacitance, Transformers, Complex variables, Mapping(Transformations), Inequalities.

AD-616 100 Div. 8/2, 25/1
CFSTI Prices: HC$2.00 MF$0.50

Trans-Sonics, Inc., Burlington, Mass.
GRAPHITE STRAIN TRANSDUCER.
Final rept., by Thomas A. Cederlund. Apr 65, 44p
Contract AF30 602 3276, Proj. 5534, Task 553401
RADC TR-65-38
Unclassified report

Descriptors: (*Acoustic detectors, Graphite), (*Transducers, Acoustics), (*Strain gages, Graphite), Microphones, Diaphragms(Mechanics), Sound, Noise.

This study was conducted to determine the applicability of using a graphite monoparticulate layer transducer as a means of detecting sound vibrations in diaphragms. Interest for this study was provided by reported gauge factor values of several thousand in strain gauges using this graphite monolayer technique. Techniques were developed for the formation and deposition of monoparticulate graphite layers and their transfer to thin film substrates. Evaluation of deposited graphite layers as strain gauges showed gauge factors of 800 for strains of 500 microinches per inch. For strains of less than 50 microinches per inch, gauge factors decrease rapidly. Transduced audio signals, when detectable above the background noise of the sensor, are distorted and for the most part unintelligible. It is concluded that, because of sensor generated noise and the small changes in transducer resistance developed by low strains, the graphite monoparticulate sensor is not an optimum method to transduce audio vibrations in diaphragms. It appears, however, that the graphite monolayer transducer might have important application when sufficient strain is produced and where high gauge output is beneficial. (Author)

AD-616 106 Div. 30/2, 20/6
CFSTI Prices: HC$6.00 MF$1.50

Boeing Co., Seattle, Wash.
A COMPUTER PROGRAM INCORPORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIATION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
Rept. for Aug 64-Mar 65,
by J. A. Barton, W. R. Doherty, and P. G. Hahn.
May 65, 269p
Contract AF29 601 6612, Proj. 5101, Task 510136
WL TR-65-10 Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Programming(Computers), Shielding), (*Space environmental conditions, Programming(Computers)), Nuclear particles, Beta particles, Electrons, Spacecraft.

The objective of this program was to incorporate the Whitaker threat model computer code into the space radiation codes. To accomplish this objective, the following tasks were performed: (1) The injection model was modified to treat the effect of extended sources at early times; (2) The emission rate spectrum was extrapolated down to 0.5 Mev and the results incorporated; (3) The spectrum of the electrons impinging on the vehicle was decomposed into energy bins suitable for dose rate and dose calculations. A description of the methods used in these tasks and the details of the resulting computer code are given. Suggestions for significantly extending the model and for improving methods for their incorporation are also presented. (Author)

AD-616 117 Div. 30/2
CFSTI Prices: HC$2.00 MF$0.50

Naval Research Lab., Washington, D. C.
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS.
Interim rept.,
by R. J. Orsino and H. G. Talmadge, Jr. 6 May 65, 26p
Rept. no. NRL-6230
Proj. SF019 01 03, Task 6168
Unclassified report

Descriptors: (*Digital computers, Design), (*Gates-(Circuits), Digital computers), Digital systems, Circuits, Algebras, Counting methods, Relaxation oscillators, Computer logic, Trigger circuits, Sequences.

A step-by-step procedure is described for designing digital counters having complex, arbitrary sequences. A divide-by-ten up-down counter is then designed to illustrate use of truth tables, 'P' terms, Veitch diagrams, and 'don't care' terms for simplifying the gate functions used to trigger each counter stage. The value of this procedure in circuit analysis as well as for circuit synthesis is then emphasized and illustrated by example. This procedure makes use of fundamental Boolean algebra and minimization techniques. (Author)

AD-616 123 Div. 8/1, 25/3
CFSTI Prices: HC$1.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
ELECTROMAGNETIC PROPERTIES OF A PLASMA-COVERED ANTENNA.
Physical sciences research papers,
by Daniel J. Jacavanco. May 65, 18p
Paper no. PSRP-105, AFCRL 65-323
Proj. 4642, Task 464202 Unclassified report

Descriptors: (*Antenna radiation patterns, Plasma sheath), (*Horn antennas, Electromagnetic properties), Experimental data, Electron density, Microwave frequency, Radio interferometers.

Antenna patterns (E-plane) of an X-band horn mounted in a ground plane and covered by a plasma slab were measured. A pulsed plasma was produced by capacitor discharge in a rectangular pyrex container of 6 in. x 2 in. x 24 in. i.d. Microwave interferometer measurements of the electron density were made at 9 and 35 Gc. Antenna patterns are presented which show a sharp decrease in radiated power at certain angles corresponding to the 'optics critical angle'. Good agreement is obtained for the movement of the optics critical angle with plasma density. (Author)

AD-616 125 Div. 8/2
CFSTI Prices: HC$1.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
TRIANGULAR-WAVEFORM GENERATOR.
Final rept.,
by John A. Croarkin. 30 Apr 65, 25p
Rept. no. TM-65-16
Projs. 1B242403D232, 60400
Unclassified report

Descriptors: (*Waveform generators, Design), Performance(Engineering), Temperature, Relaxation oscillators.

A symmetrical-triangular-waveform generator has been developed. The output frequency or PRF is voltage controlled. Five discrete PRF's spanning a ten-to-one frequency range are provided. The amplitude of the output waveform is adjustable from 20 to 60 v peak-to-peak. The circuit operates within specifications over a temperature range of -65 to +165F. (Author)

AD-616 126 Div. 30/5
CFSTI Prices: HC$1.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
AN EASY WAY TO DETERMINE THE SHAPE OF A DRIVING FUNCTION FROM THE RESPONSE OF A LINEAR SYSTEM,
by J. S. Wicklund. 20 Apr 65, 20p Rept. no. TM-65-19
Proj. 23000
Unclassified report

Descriptors: (*Functions, Linear systems), Performance-(Engineering), Measuring devices(Electrical + electronic), Numerical analysis.

A method is described for correcting data to account for the response of the measuring device. It is particularly useful for work with transient signals, and numerical examples of this application are given. (Author)

AD-616 132 Div. 8/2

Lincoln Lab., Mass. Inst. of Tech., Lexington.
HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER,
by H. J. Pratt, W. J. Ince, and R. C. Sicotte.
21 Dec 64, 1p Rept. no. JA2498
Contract AF19 628 500

Unclassified report

Pub. in Proceedings of the IEEE v53 n3 p305 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Waveguides, Design), Varactor diodes, Waveguide filters, Sidebands, Noise, Circuits.

A large signal, single varactor upper-sideband upconverter having an efficiency approaching the theoretical maximum value was developed. The output of the device is extremely stable and free of spurious signals. The circuit also gave nearly identical performance for a number of diodes having similar characteristics. The pump and output tuning was left unchanged, and only a slight reoptimization of the input tuning and the bias voltage was required.

AD-616 144 Div. 30/2

Electronics Research Lab., Univ. of California, Berkeley.
REDUCED FORMS FOR STOCHASTIC SEQUENTIAL MACHINES,
by J. W. Carlyle. 1963, 12p Rept. no. 64-37
Contract Nonr22253

Unclassified report

Pub. in Journal of Mathematical Analysis and Applications v7 n2 p167-75 Oct 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stochastic processes, Input-output devices), Switching circuits, Sequences, Machines, Automata.

AD-616 149 Div. 8/3, 30/3

Lyman Lab. of Physics, Harvard Univ., Cambridge, Mass.
AMPLITUDE AND DECAY RATE ANALYSIS OF LOW LEVEL EXPONENTIALLY DECAYING RADIO-FREQUENCY SIGNALS,
by Howard C. Berg. 6 Nov 64, 5p

Unclassified report

Research supported by National Science Foundation, and Office of Naval Research, Washington, D. C.
Pub. in Review of Scientific Instruments v36 n3 p330-4 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Radiofrequency pulses, Measurement), Audiofrequency, Signal-to-noise ratio, Masers, Hydrogen.

A method is described which allows routine measurements of the relative amplitudes and absolute decay rates of low level exponentially decaying radio-frequency signals to be made to within an accuracy of 1%. The signals are converted to audio frequency, narrow banded, rectified, and integrated over two successive periods of time. The theory of the measurement, which is given in detail, shows how the analysis can be made in the presence of noise which is white over a frequency bandwidth large compared to the inverse decay times. The general features of the circuits are described, and a schematic is given for a nearly ideal full-wave linear rectifier. (Author)

AD-616 171 Div. 8/2

Mitre Corp., Bedford, Mass.
A MICROWAVE TUNNEL DIODE AMPLIFIER,
by Robert D. Gallagher. 1965, 8p
Contract AF19 628 2390
ESD TDR-64-100

Unclassified report

Pub. in Microwave Journal p2-8 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Tunnel diodes, Microwave amplifiers), (*Microwave amplifiers, Tunnel diodes), Design, Gain, Bandwidth, Noise, Waveguide circulators, Standing wave ratios, Stability.

It is shown that a tunnel diode microwave amplifier can be built which has stable gain, a useful bandwidth and a reasonable noise figure. This performance is by no means the ultimate that one should expect from a microwave tunnel diode amplifier. With subsequent improvements in ferrite circulator and tunnel diode technology, it is expected that significant improvements will be made with respect to bandwidth, noise figure and dynamic range. (Author)

AD-616 235 Div. 8/1, 8/6

Lockheed Missiles and Space Co., Palo Alto, Calif.
THE COMBINED RADIATION PATTERN OF THREE ORTHOGONAL DIPOLES,
by Forrest F. Fulton, Jr. 9 Oct 64, 1p
Contract NOw63 0050

Unclassified report

Pub. in IEEE Transactions on Antennas and Propagation vAP13 n2 p323-4 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Dipole antennas, Antenna radiation patterns), (*Antenna radiation patterns, Dipole antennas), Electromagnetic waves, Polarization, Alignment, Distribution, Power.

Occasions arise when it is desirable to radiate a signal with an isotropic radiation pattern. A way to approximate this pattern is to use several antennas excited with different waveforms, so arranged that the nulls from one antenna are filled in by power from the others. This communication discusses the average power received by a linearly polarized receiving antenna from three randomly oriented but mutually orthogonal dipoles. The conclusion obtained is that when the excitations are mutually time-orthogonal, and the individual patterns are perfect short-dipole patterns, the average power received is independent of the orientation. (Author)

AD-616 239 Div. 8/2
CFSTI Prices: HC$1.00 MF$0.50

Naval Air Test Center, Patuxent River, Md.
INVESTIGATION OF FILTER CHARACTERISTICS

OF ARRAYED CONDUCTORS BETWEEN GROUND PLANES.
Interim rept.,
by P. V. Roberts. 15 Jun 65, 17p WST4-527
Unclassified report

Descriptors: (*Band-pass filters, Design), Conductivity, Propagation, Tests.

An interdigital line filter was designed, manufactured, and investigated. The band-pass characteristics indicate that the filter has an extremely sharp cutoff which would be useful in the measurement of spectrum signatures. (Author)

AD-616 240 Div. 30/2
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS,
by H. M. Markowitz and R. C. Steorts. Jun 65, 67p
Rept. no. RM-4242-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.

Descriptors: (*Game theory, Programming(Computers)), (*Programming(Computers), Game theory), Simulation, Control sequences, Programming languages.

A presentation of routines to be used with any SIMSCRIPT simulation program. They provide snapshot, modify, and restart capabilities for the following game and experiment applications: (1) man/machine games in which the computer simulates a system for a period of time, humans then use the results to decide on changes in policy parameters for the following period, and the computer resumes simulations where it left off but with policy parameters modified; and (2) simulation experiments in which snapshots of the simulated system are recorded on tape at various points in time. After inspecting the periodic and summary print-outs produced by the simulation, an analyst may specify a return to some snapshot, modify one or more parameters, and resume simulation at that point. While this revised simulation is running, additional snapshots may be taken so that the process can be repeated. (Author)

AD-616 256 Div. 8/2, 26/1
CFSTI Prices: HC$1.00 MF$0.50

Valpey Fisher Corp., Holliston, Mass.
QUARTZ CRYSTAL UNIT CR-(XM-37)/U,
Quarterly progress rept. no. 10, 1 Oct-31 Dec 64,
by Norman R. Gillin. 31 Dec 64, 20p
Contract DA36 039SC85972
Unclassified report

See also AD-614 924.

Descriptors: (*Quartz resonators, Manufacturing methods), Resistance(Electrical), Soldering, Seals(Stoppers), Crystal holders, Crystal oscillators, Inductance, Capacitance, Vibration, Aging(Materials), Quality control, Performance(Engineering).

In view of 70 ohm maximum effective resistance of SCS-75 and the test results on preproduction lots, Technical Action Request 3 was submitted requesting 90 ohms maximum. This request was approved 19 November, 1963. Due to subsequent failure of some preproduction units in Salt Spray and Moisture Resistance, the soldering and sealing procedures were revamped. Five units out of thirty tested exceeded frequency tolerance during Temperature Test. This was corrected by slightly lowering angle of cut and by more careful temperature testing in the TS-15 test oscillator. (Author)

AD-616 264 Div. 8/2, 8/4
CFSTI Prices: HC$4.00 MF$1.00

Philco Corp., Blue Bell, Pa.
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
Final rept. for May 63-Nov 64,
by Max A. Kraft, A. B. Measor, and R. Middlestead.
Apr 65, 148p
Contract AF30 602 3056, Proj. 4506, Task 450601
RADC TR-65-5
Unclassified report

Descriptors: (*Delay circuits, Phase shifters), Broadband, Intermediate frequency, Networks, Varactor diodes, Tuned circuits, Feasibility studies, Variable resistors, Variable capacitors.

A modification to the network, the all-pass half-lattice network was studied for its variable time delay properties and implemented to obtain time delay variation of 72 nanoseconds in excess of a constant delay. Twenty sections were cascaded to obtain the delay variation. The controlled elements were 2 capacitors and 3 resistors. The cascade could be switched from one delay state to a second delay state within 10 microseconds. The signal bandwidth goal was 20 Mc. The signal bandwidth achieved was 40 Mc, the band extending from 20 Mc to 60 Mc. An all-pass resistance-capacitance section was developed, providing a simpler control of the time delay. A variable voltage applied to a varactor was the complete control mechanism for the section. A total of 18 sections were cascaded to demonstrate the feasibility of the technique. A time delay variation of 23 nanoseconds was available with a switching time of 5 microseconds to change the delay state. The signal bandwidth obtained exceeded that of the lattice network approach. A bandwidth of 65 Mc, the band extending from 15 Mc to 80 Mc, was achieved. (Author)

AD-616 266 Div. 8/2
CFSTI Prices: HC$2.00 MF$0.50

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLICATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS,
by D. C. Youla. Apr 65, 50p
Rept. no. PIBMRI-1252-65
Contract AF30 602 2868; Grant AF AFOSR62 280,
Proj. 8505, Task 850501
RADC TR-65-86
Unclassified report

Descriptors: (*Electric filters, Synthesis), (*Electrical networks, Synthesis), (*Functions, Theorems), Circuits, Gain, Electrical impedance.

It is first shown that the power gain of a filter which has been partitioned into two component parts may be expressed in terms of a formula involving only the two impedances seen looking to the left and the right of the common junction. By imposing the constraints of symmetry and antimetry this formula leads quite naturally to two global equations for positive-real functions. Theorems 1 and 2 present necessary and sufficient conditions for the existence of solutions. Moreover, the construction of these p.r. functions is made to depend on two algorithms of an extremely simple character. The

theory is fully illustrated by means of four worked, non-trivial examples. Finally, it is pointed out that synthesis by bi-section is often wasteful of reactances (especially in the symmetric case) and a careful count of elements is presented for antimetric filters. (Author)

AD-616 269 Div. 30/2
CFSTI Prices: HC$2.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
COMPUTER TECHNOLOGY, 1963, NO. 3 (SELECTED ARTICLES),
by L. M. Asoyan and M. G. Gevorkyan. 7 May 65, 50p FTD-TT-65-108
TT 62431

Unclassified report

Unedited rough draft trans. of Moskovskoe Vysshee Tekhnicheskoe Uchilishche. Vychislitel'naya Tekhnika (USSR) n3 p74-90, 103-21 1963.

Descriptors: (*Digital computers, Resonators), (*Computer logic, Resonators), Circuits, Switching circuits, Triggering circuits, Capacitors, Resistors, Oscillators, Ferrites, Magnetic core storage, Transformers, Diodes-(Semiconductor), Magnetic tape, USSR, Computers.

Contents:
The parametron: an element in digital computers, by L. M. Asoyan: General information on parametrons; fundamental properties of parametric oscillations; operating principle of the parametron; variable-inductance parametron; multihole ferrite parametrons; variable-capacitance parametron; magnetic-film parametron; three-cycle and two-cycle methods of driving parametrons; construction of parametron logic circuits
Certain problems in the investigation of the parametron, by L. M. Asoyan and M. G. Gevorykan: Calculations of parametron driving current and determination of specifications for core material; determining optimum operating point; certain ways to reduce the power drawn by the parametron; determining the parameters of the parametron resonance network; calculating the parameters of the coupling transformer; determination of the largest number of parametrons that can be connected at the output of a control parametron; determining rise and fall times of the subharmonic oscillations in the parametron; determining the largest number of input signals that can be connected at a parametron's input.

AD-616 270 Div. 30/3
CFSTI Prices: HC$3.00 MF$0.75

Frankford Arsenal, Philadelphia, Pa. Research and Development Directorate.
A STANDARD ARMY MICROWAVE POWER CALIBRATION SYSTEM FOR THE 26.5 TO 40 GIGACYCLE RANGE.
Interim rept.,
by R. A. Kauffmann. Apr 65, 75p
Memo. rept. no. M65-16-1

Unclassified report

Descriptors: (*Radiofrequency power, Standards), Calibration, Microwave equipment, Calorimeters, Army equipment.

This report describes the work performed to develop a secondary reference standard for calibrating microwave power measuring instruments in the 26.5 to 40 gigacycle range. This standard is of the reflectometer type, which not only measures the microwave power actually entering the device being calibrated, but also measures the microwave power that is reflected from the instrument under calibration. Also included in the report is a description of the theoretical and experimental work performed to develop an interim Army primary microwave power standard in the 26.5 to 40 gigacyle range, which was required to calibrate the secondary reference standard. (Author)

AD-616 274 Div. 8/7, 8/6, 8/3, 8/4
CFSTI Prices: HC$2.00 MF$0.50

Bomac Div., Varian Associates, Beverly, Mass.
NOISE SOURCE FOR MILLIMETER WAVELENGTH.
Progress rept. no. 5 (final) 1 Jul 63-1 Oct 64,
by Arnold M. Eklund. 1 Oct 64, 48p
Contract DA36 039AMC03229E,
Task 1G6 22001A055 04

Unclassified report

Descriptors: (*Millimeter waves, Noise(Radio)), (*Noise(Radio), Millimeter waves), Standards, Extremely high frequency, Neon, Argon, Mixer tubes, Klystrons, Waveguides, Waveguide switches.

The hot load noise standard operating at 1000C produces an excess noise factor of 5.3 db above room temperature, which when reduced by waveguide losses totals 4.85 db at the waveguide switch junction of the calibration test set-up. Investigation of neon and argon filled noise tubes was completed with fill pressures varying from 5 to 60 mm of Hg. The noise tubes were calibrated against the hot load standard using a single ended mixer at 3.2 mm and a balanced mixer at 4.3 mm. The noise output from the neon tubes measured only slightly higher than the argon tubes. The operating temperature of the neon tubes, however, was very high and increased with life, causing tube failure after approximately 50 hours. The argon tubes operated relatively cool, and the noise output did not change over 350 hours operating life. Several noise tube mounts were investigated. These mounts positioned the noise tube at various angles from 0 to 17 degrees with respect to the waveguide. It was determined that the noise output from the 0 degrees mounted tube exceeded that of the 15 degrees mount by almost 2 db. However, the unfired match of the latter was better. Excess noise ratio measurements varied between 17.7 and 18.1 db, when compared to the hot load standard operating at 1000C. (Author)

AD-616 299 Div. 8/2, 26/1
CFSTI Prices: HC$1.00 MF$0.50

Mallory (P. R.) and Co., Inc., Indianapolis, Ind.
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS.
Quarterly rept. no. 7, 30 Dec 64-29 Mar 65,
by A. W. H. Smith. 29 Mar 65, 15p
Contract DA36 039AMC03623E

Unclassified report

See also AD-612 647.

Descriptors: (*Tantalum capacitors, Manufacturing methods), Sintering, Quality control, Production, Electrolytic capacitors, Anodes(Electrolytic cell), Wet cells, Manganese compounds, Dioxides, Powder metals, Environmental tests, Reliability(Electronics), Specifications, Performance(Engineering), Stresses.

The object of this production engineering measure is to improve production techniques for the manufacture of 33 mfd-35Volt solid electrolyte tantalum capacitors to attain a maximum failure rate of .001 per cent per 1000 hours with a 60 per cent confidence level. (Author)

AD-616 309 Div. 30/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ON METHODS OF ECONOMIZING THE MEMORIES OF DIGITAL COMPUTERS WHEN SOLVING DIFFERENTIAL EQUATION SYSTEMS,
by I. N. Molchanov. 13 May 65, 22p
FTD-TT-65-34
TT 65-62442
Unclassified report

Unedited rough draft trans. of Sibirskii Matematicheskii Zhurnal (USSR) v5 n1 p109-23 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Differential equations, Boundary value problems), (*Digital computers, Boundary value problems), Iterative methods, Computer logic, Computer storage devices, USSR.

In this report are discussed methods of solving boundary problems for two-and three dimensional self-conjugated differential equations of elliptical type in an arbitrary grid zone. To solve the obtained system of differential equations, simple iteration type methods are proposed, allowing to remember simultaneously the values of the sought for function only in part of the units. Discussed is the convergence of formulated iteration processes and theoretical evaluation of the rate of convergence for the so-called 'single line' method. (Author)

AD-616 325 Div. 30/2, 8/2, 15/1
CFSTI Prices: HC$3.00 MF$0.75

Lockheed Missiles and Space Co., Sunnyvale, Calif.
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC,
by Roy Dewitt Merrill, Jr. Jun 65, 76p
Rept. no. 6-75-65-29
Unclassified report

Descriptors: (*Switching circuits, Computer logic), (*Computer logic, Switching circuits), (*Special functions(Mathematical), Switching circuits), Digital systems, Digital computers, Networks, Synthesis.

The important properties of symmetric functions are presented and a systematic procedure is developed for detecting these functions. A design method is given whereby symmetric functions can be synthesized with networks which are economical and, in certain instances, minimal in the number of ternary threshold devices required. The practical consequences of these results are demonstrated by applying detection and logic design techniques to a typical digital system problem.

AD-616 329 Div. 8/2
CFSTI Prices: HC$6.00 MF$1.25

Case Inst. of Tech., Cleveland, Ohio.
THE GYRATION OPERATOR IN NETWORK THEORY,
by R. J. Duffin, D. Hazony, and N. Morrison.
Jan 65, 230p Scientific rept. no. SR-7
Contract AF19 628 1699, Proj. 5635, Task 563502
AFCRL 65-249
Unclassified report

See also AD-605 449.

Descriptors: (*Electrical networks, Theory), (*Operators (Mathematics), Electrical networks), (*Matrix algebra, Electrical networks), Combinatorial analysis, Synthesis.

The gyration operator which generates a matrix from a given matrix is defined. It is shown that the gyration is related to the concept of combinatorial equivalence. The hybrid matrices of network theory are gyration matrices. The ABCD and hybrid matrices are combinatorially equivalent to their impedance and admittance matrices. All combinatorially equivalent matrices have the same degree. The gyration operator also preserves the PR property as well as the rank of the hermitian part. The gyration operators form an involutary Abelian group. The PR property is shown to extend beyond the impedance and admittance matrices of a passive network, and a complete set of PR matrices is given for the description of the network. The relationships between the scattering and gyration operators are detailed. A complete synthesis procedure, based on the gyration operator is given. Any PR immittance matrix can be synthesized. Three worked examples are included. Of special significance is a novel concept of enumerating the degree of a rational matrix function. (Author)

AD-616 331 Div. 8/2, 25/1
CFSTI Prices: HC$2.00 MF$0.50

Texas Instruments, Inc., Dallas.
LOW-NOISE L-BAND AMPLIFIER,
Quarterly progress rept. no. 3, 1 Dec 64-28 Feb 65,
by Leslie W. Read, George D. Johnson,
Roger R. Webster, and R. L. Petritz. 28 Feb 65, 35p
Rept. no. TI-03-65-33
Contract DA28 043AMC00109E, Proj. 1P622001A056
Unclassified report

See also AD-609 494.

Descriptors: (*Transistor amplifiers, L band), Printed circuits, Gain, Noise(Radio), Bandwidth, Electrical impedance, Admittance, Transformers, Germanium, Band-pass filters, Radiofrequency amplifiers, Coupling circuits, Delay circuits, Design, Performance(Engineering).

Work on single-stage and three-stage transistor amplifier design and construction is described. Common-base measured Y parameters on recent L-78A devices are presented. The possibility of using common emitter is being reviewed because of recent improvements in device performance. The gain of the single-stage amplifiers is now relatively predictable from measured Y parameters, using the Linvill charts. The common-base L-78A transistors give typically 8 to 13 db of gain at about 1.3 Gc with -3 db bandwidths ranging from 400 to 110 Mc in a microstrip circuit. The noise figures of the single stages are 4.5 to 5 db. The minimum corrected noise figure varies with load; the lowest measured noise figure occurs when the gain is highest. This variation with load is not in agreement with theory, and the cause of this variation is being investigated. A three-stage amplifier breadboard has been constructed which meets the gain-bandwidth design objectives. The noise figure is 5.8 db, in good agreement with the calculated value of 5.5 db. Phase shift on the amplifier will be measured when a phase measurement test set now on order is delivered. Earlier measurements using borrowed equipment have indicated that this will not be a severe problem. (Author)

AD-616 356 Div. 8/1, 8/2
CFSTI Prices: HC$4.00 MF$0.75

Motorola, Inc., Scottsdale, Ariz.
INTEGRATED RADIATORS STUDY AND INVESTIGATION.
Final rept. for 26 Dec 63-26 Dec 64,
by E. Murphy, D. R. Wehner, J. B. MacDougall, and P. L. Shelton. Apr 65, 102p
Contract AF30 602 3270, Proj. 4519, Task 451902,
RADC TR-65-44
Unclassified report

Descriptors: (*Transmission lines, Antenna feeds), (*Antennas, Transistor amplifiers), Antenna configurations, Yagi antennas, Ultrahigh frequency, Gain, Bandwidth, Phased arrays, Feasibility studies.

The report describes the results of a twelve month study of techniques in integrated radiator design. This study at UHF has resulted in theoretical analysis and experimental evaluations of integrated radiator techniques. These techniques involve the integration of active solid state devices into radiating structures to improve the physical and electrical characteristics of a device capable of one or more functions. This device, or functional component, can provide improved gain, bandwidth, or other desirable electrical characteristics while requiring a smaller volume and fewer components and interconnections. In this investigation several classes of radiators were carefully selected for integration with various solid state devices. (Author)

AD-616 366 Div. 8/2
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
DIRECTIONS OF MATHEMATICAL RESEARCH IN NONLINEAR CIRCUIT THEORY,
by Richard Bellman. 23 Sep 59, 46p
Rept. no. P-1802
Unclassified report

Descriptors: (*Circuits, Theory), (*Mathematics, Circuits), Control.

AD-616 375 Div. 30/2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
CONTINUOUS PROGRAMMING METHODS ON AN ANALOG COMPUTER,
by E. C. DeLand. 29 Sep 59, 12p Rept. no. P-1815
Unclassified report

Presented at the Symposium on Mathematical Programming, sponsored by The RAND Corp., at the Santa Monica Civic Auditorium, Santa Monica, Calif., 16-20 Mar 59. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Analog computers, Programming-(Computers)), (*Programming(Computers), Analog computers), Mathematical programming.

A feasible solution of a programming problem, in which a positive vector x maximizes a function g(x) under m convex conditions f sub i (x) < or = O usually exhibits certain stable properties and the entire system can be said to be in equilibrium or that it is an equilibrium model. Beginning at a solution, a time transient may be induced in the system by making f and/or g functions of time. Methods for examining such transients on the analog computer are examined with examples. The problem considered here arises because often the behavior of a system in time under the influence of a variation of parameters is as interesting as the initial or final stable states. Typical examples are found in a petroleum fractionating column or a complex chemical equilibrium.

AD-616 376 Div. 30/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
AN EXPERIMENT IN CHESS PLAYING BY MACHINE,
by Fred Gruenberger. 13 Oct 59, 11p
Rept. no. P-1820
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. Letter to be published in Computing News.

Descriptors: (*Game theory, Computers), Programming-(Computers).

AD-616 388 Div. 8/2, 25/6, 26/1
CFSTI Prices: HC$1.00 MF$0.50

Knights (James) Co., Sandwich, Ill.
CRYSTAL UNITS TYPE CR-(XM-11)/U, + TO 20 MC IN THE TYPE HC-27/U GLASS HOLDERS,
Progress rept. no. 14, 1 Aug-31 Oct 64,
by R. E. Bennett. 31 Oct 64, 21p
Contract DA36 039SC81274
Unclassified report

See also AD-606 808.

Descriptors: (*Crystals, Semiconductor devices), (*Crystal holders, Manufacturing methods), High frequency, Quartz, Design, Specifications, Test methods, Performance(Engineering), Wiring diagrams, Production, Inductance, Bonding, Glass.

The programming of an induction sealing machine is described, together with statistics on its production capacity, and on its yield of good units. Yields throughout processing of 4.3 mc, 9 mc, 15.5 mc, and 20 mc units are given. (Author)

10. Energy Conversion (Non-propulsive)

AD-615 885 Div. 7/6, 7/5
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., West Lynn, Mass.
SATURATED HYDROCARBON FUEL CELL PROGRAM.
Technical summary rept. no. 3, pt. 1, task 4, 1 Jan-30 Jun 63,
by E. J. Cairns and A. D. Tevebaugh. 30 Jun 63, 56p
Contract DA44 009ENG4909, Proj. 8A72 13 001 506,
ARPA Order 247

Unclassified report

Descriptors: (*Fuel cells, Hydrocarbons), (*Hydrocarbons, Fuel cells), Design, Electrolytes, Test equipment, Reliability, Performance(Engineering), Cesium compounds, Carbonates, Platinum, Electrodes.

The objective of Task IV is the study of hydrocarbon fuel cells with non-acid electrolytes. New cell hardware was designed and constructed, based on previous experience with organic fuels. High precision material balance equipment was constructed, and calibrations for the initial phases of the work were completed. As a first stage in the hydrocarbon work, the new equipment was tested on a well known system in order to prove the reliability of the apparatus and to test the usefulness of the off-specification lot of cesium carbonate purchased for this work. The second stage, that of establishing the performance of saturated hydrocarbons in the present system of platinum electrodes and cesium carbonate electrolyte, followed by suitable modifications for performance improvement, is now in progress. (Author)

AD-615 939 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$6.00 MF$1.25

Electrical Engineering Research Lab., Cornell Univ., Ithaca, N. Y.
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
Quarterly progress rept. no. 4, 1 Jul-30 Sep 64,
by S. C. Wang and J. Walder. Apr 65, 229p
Contract AF30 602 3243
RADC TR-64-563 V2

Unclassified report

Report includes A Theoretical Study of Biased Drift-Tube Klystrons and The Biased Gap Klystron.

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Circuits, Electron beams), (*Klystrons, Electron beams), Plasma physics, Cavity resonators, Gain, Space charges.

A method is described to improve both the gain and efficiency of conventional klystrons by varying the beam impedance through the change of d-c beam voltage at appropriate locations along the beam. Results are given in both small- and large-signal analyses for two- and three-cavity klystrons with gridded- and gridless-gap resonators. Analytical expressions of beam-loading conductance for a transformed beam interacting with both gridded- and gridless-gap resonators are derived. From small-signal theory the efficiency was found to be directly proportional to M squared/G and the gain to (m sub b M) squared/G (where M is the beam-coupling coefficient, G is the beam-loading conductance, and m sub b is ratio of transformed beam velocity to original beam velocity). This is valid in the large-signal domain, provided that M and G are a-c voltage independent. The large-signal efficiency was found to be dependent on a-c velocity spread only after the transit angle of the output gap decreased to a certain limit. The best location for putting bias was found to be the point of a-c velocity minimum. (Author)

AD-615 940 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$6.00 MF$1.50

Electrical Engineering Research Lab., Cornell Univ., Ithaca, N. Y.
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
by D. M. Kerr, Jr., S. Y. Narayan, and R. J. Myers. Apr 65, 267p
Contract AF30 602 3243
RADC TR-64-563 V5

Unclassified report

Report includes Investigation of a Hydrogen Plasma for use in a Microwave Amplifier; A Study of the Coupling of Microwave Signal to Beam-Plasma Amplifiers; and An Experimental Investigation of Electron Beam Characteristics in a Beam-Plasma Interaction Amplifier.

Also includes An Experimental Study of Noise Growth in Scalloped and Nonscalloped Brillouin Beams and The Growth of Peak Velocity, Noise, and Signals in O-Type Electron Beams.

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Plasma physics, Electron beams), Klystrons, Electron tubes, Microwave amplifiers, Lasers, Circuits, Space charges, Harmonic analysis, Noise(Radio), S band, Gain.

Theoretical and experimental investigations of linear beams and their interaction with appropriate circuits are conducted; and new methods of generating small dense electron beams are devised and their interactions with a plasma investigated. The application of these phenomena to the effective generation and amplification of high-frequency high-power microwave signals is studied. This report consists of six volumes. Volume I begins with a General Report reviewing all the tasks. When the data or results of a study are not extensive, they are reported in this general report. When a study is extensive or complete, it is presented in a separate report, which is appended.

AD-615 961 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$6.00 MF$1.50

Cornell Univ., Ithaca, N. Y. School of Electrical Engineering.
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
Quarterly progress rept. no. 4, 1 Jul-30 Sep 64,
by B. K. Andal, T. G. Mihran, G. C. Dalman, L. Eastman, and L. MacKensie. Apr 65, 276p
Contract AF30 602 3243, Proj. 5573, Task 557303
RADC TR-64-563 V1 Unclassified report

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Plasma physics, Electron beams), (*Microwave amplifiers, Plasma physics), Hydrogen, Electric discharges, Plasma medium, Density, S-band, Cavity resonators, Tensor analysis.

A Penning discharge was used to generate in hydrogen a plasma suitable for use in a microwave electron beam plasma amplifier. Plasma densities on the order of 10 to the 11th power electrons per cubic centimeter were obtained. A two-fluid theoretical model of the plasma was developed in order to explain the operation of the discharge. It is supported by diagnostic measurements of two kinds, microwave-cavity measurements and probe measurements. The detuning of a resonant microwave cavity was found to be a fast and reliable method for measuring the average plasma density. Probe measurements provided information on the average plasma-electron energies and on the shape of the radial plasma-density profile. The design of the cavities is described in full, and equivalent circuit concepts are found to be useful in interpreting the experimental results. The probe and cavity measurements both showed that plasma densities that will permit the operation of a beam-plasma amplifier at S-band can be generated in the present system using hydrogen gas. (Author)

AD-615 962 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$6.00 MF$1.25

Cornell Univ., Ithaca, N. Y. School of Electrical Engineering.
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION,
by C. Sun and R. C. Sander. Apr 65, 226p
Contract AF30 602 3243
RADC TR-64-563 V3
Unclassified report

Also includes A Theoretical and Experimental Study of Klystron Efficiency Enhancement and Cross-Modulation and Intermodulation Amplitude Distortion in Klystron Amplifiers.

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Klystrons, Electron beams), Plasma physics, Conductivity, Modulation, Circuits, Cavity resonators, Microwave amplifiers.

Basic factors affecting klystron efficiency are investigated: (1) modulation coefficients or coupling coefficients; (2) small-signal beam-loading conductance and large-signal beam-loading conductance; and (3) input conditions of current modulation and velocity modulation.

AD-615 963 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$4.00 MF$1.00

Cornell Univ., Ithaca, N. Y. School of Electrical Engineering.
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY,
by F. Einaudi. Apr 65, 127p
Contract AF30 602 3243
RADC TR-64-563 V4
Unclassified report

Also includes Nonlinear Analysis of Finite Electron Beams for Excitation Having Arbitrary Radial Dependence.

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Electromagnetic pulses, Klystrons), Plasma physics, Space charges, Modulation, Electric currents, Electric fields, Magnetic fields, Mathematical models, Excitation.

A theory based on an idealized model and including space charge explicitly is developed for the nonlinear behavior of an electron beam velocity-modulated by an ideal gap and of finite cross section filling a conducting cylinder. A strong axial magnetic field allows the motion of electrons in the axial direction only. An expression for the current density has been derived using a method of successive approximations. Starting from the known solution for the infinite beam, successive approximations have been considered to take account of the finite radius of the beam. The axial component of the electric field as a function of r and z has been evaluated. (Author)

AD-615 973 Div. 7/1
CFSTI Prices: HC$3.00 MF$0.75

Eagle-Picher Co., Joplin, Mo.
RESEARCH ON AMMONIA BATTERY SYSTEM.
Final rept. for 1 Jul 63-31 Aug 64,
by D. J. Doan, L. R. Wood, and Leroy Folks.
31 Aug 64, 64p Rept. no. R-16
Contract DA36 039AMC02173E,
Proj. 1C6 22001A053, Task 1C6 22001A053 02
Unclassified report

See also AD-429 191.

Descriptors: (*Batteries + components, Ammonia), (*Ammonia, Liquefied gases), Wet cells, Electrolytes, Anodes(Electrolytic cell), Cathodes(Electrolytic cell), Potassium compounds, Chlorates, Silver compounds, Chlorides, Thiocyanates, Performance(Engineering), Separation, Porosity, Electric currents, Density, Hazards, Cellulosic plastics.

During the contract period, considerable data have been developed regarding cell energy density improvement. Cells have been improved from 28.6 watt-minutes/cu inch at the +125 F ambient. A six-cell series connected 'mock-up' battery was tested at the +125 F ambient and 42.4 watt-minutes/cu inch was achieved which projected into battery hardware results in about 4 watt-hours/pound. Operation of this unit at -65 F should yield approximately 6.0 watt-hours/pound. The best six-cell bettery prior to this contract gave 2.0 watt-hours/pound. Both conventional and statistical experimentation have been utilized during this contract effort and from these studies, many specific factors that influence cell performance have been evaluated. The more pertinent factors are: cell void, electrolyte moisture content, type grid, discharge temperature, percent silver chloride and paste weight of the cathode and current density. (Author)

AD-616 001 Div. 8/4, 8/6, 25/3, 25/4
CFSTI Prices: HC$5.00 MF$1.00

Electrical Engineering Research Lab., Cornell Univ., Ithaca, N. Y.
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION,
by L. A. MacKenzie and D. M. Stevenson. Apr 65, 167p
Contract AF30 602 3243
RADC TR-64-563 V6
Unclassified report

Report includes The Diffusion of Magnetic Fields

Through Conductors and the Design of Pulsed Solenoids, and High Current-Density Beams using Indirect Emission from Laser-Irradiated Cathodes.

Descriptors: (*Electron beams, Microwave frequency), (*Radiofrequency power, Microwave frequency), (*Lasers, Electron beams), Solenoids, Diffusion, Magnetic fields.

The diffusion of time-varying magnetic fields through conductors is examined, and the quantitative results are applied to pulsed solenoids to obtain the axial magnetic fields produced by these devices. Based upon these results a design procedure is established for simple pulsed solenoids. A trial design and its experimental results are presented for comparison with the theory. (Author)

AD-616 108 Div. 7/6, 7/5
CFSTI Prices: HC$3.00 MF$0.75

Ionics, Inc., Cambridge, Mass.
HYDROGEN-BROMINE FUEL CELL.
Final rept. for Apr 61-Oct 63,
by Werner Glass. 11 Dec 64, 64p
Contract AF19 604 8508, Proj. 6694, Task 669407
AFCRL 65-34
Unclassified report

Descriptors: (*Fuel cells, Construction), Ion exchange, Membranes, Hydrogen, Bromine, Electrochemistry, Performance(Engineering), Platinum, Tantalum, Niobium, Polymers.

Various problems associated with the construction of practical cells were studied. Platinum, tantalum, niobium and tri or tetrafluoroethylene polymers were found to be acceptable materials of construction. Aqueous HBr was determined to be the best solubilizer for Br2. Properties of HBr-Br2-H2O solutions were investigated in considerable detail. The Br2 solubilized by the HBr was found to act electrochemically mainly as an inert diluent. A special low-water-content ion exchange membrane minimized diffusive attack of Br2 on the anode and permitted cell life to be extended to well over a year. The chemical composition of this membrane could be changed considerably by partial bromination without affecting fuel cell performance: the membrane acted primarily as an aqueous permeable membrane (with steric hindrance of ions as large as Br(-), Br3(-), or the like) rather than as a true ion exchange barrier. The effective internal resistance of present cells is still high: on the order of 8 ohm-sq cm of which about half is directly due to the ion exchange membrane. (Author)

AD-616 120 Div. 7/1, 4/3
CFSTI Prices: HC$2.00 MF$0.50

Army Electronics Command, Fort Monmouth, N. J.
ORGANIC DEPOLARIZED PRIMARY BATTERIES.
Progress rept. no. 1,
by Joseph C. Pawlak. Mar 65, 38p Technical rept. ECOM-2567
Proj. 1C6 22001A053, Task 1C6 22001A053 02
Unclassified report

Descriptors: (*Batteries + components, Nitrobenzenes), (*Dry cells, Polarization), Carbon black, Cathodes(Electrolytic cells), Life expectancy, Organic compounds, Magnesium, Magnesium compounds, Vanadium compounds, Oxides.

A detailed discussion of the performance of organic depolarized primary cells incorporating the most promising carbon blacks, with and without the addition of vanadium pentoxide (V2O5) to the cathode is presented. Cell performance data are included for a study of cathodic formulations conducted over a range of temperatures and discharge rates. Shelf life data for organic depolarized A-size Cells stored for periods up to three years are reported. A method devised to predict the capacity retention of an organic depolarized dry cell after storage is described. (Author)

AD-616 260 Div. 7/5, 25/3
CFSTI Prices: HC$1.00 MF$0.50

Allison Div., General Motors Corp., Indianapolis, Ind.
MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMADYNAMIC POWER GENERATORS.
Quarterly technical summary rept. no. 8,
1 Feb-30 Apr 65,
by H. E. Wilhelm. 25 May 65, 18p EDR-4296
Contract Nonr410400, Proj. 3980, ARPA Order 420
Unclassified report

See also AD-616 260.

Descriptors: (*Magnetohydrodynamics, Generators), (*Energy conversion, Magnetohydrodynamics), Electric power equipment, Magnets, Heaters, Plasma medium, Thermal diffusion, Resistance(Electrical), Electrical conductance, Fluid dynamic properties, Measurement.

Experimental effort during the report period was directed toward completion of the new test section, magnet, and heater. In the theoretical portion of the program, Ohm's law was derived for nonisothermal plasma with thermal diffusion.

AD-616 336 Div. 7/6, 7/2
CFSTI Prices: HC$5.00 MF$1.25

General Electric Co., Philadelphia, Pa. Missile and Space Div.
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
Final rept. for 1 Mar 61-28 Feb 65,
by R. C. Good, Jr. Jun 65, 196p
Rept. no. R65SD25
Contract AF49 638 1030, Proj. 9782, Task 37718
AFOSR 65-0988
Unclassified report

Descriptors: (*Energy conversion, Electromagnetic waves), (*Exploding wires, Energy conversion), (*Electromagnetic waves, Energy conversion), (*Glass, Electromagnetic waves), (*Radiation damage, Electromagnetic waves), Plastics, Plasma physics, Stresses, Thermal stresses, Instrumentation, Resistance(Electrical), Electric discharges, Thermocouples, Mathematical analysis.

An exploding wire apparatus was used to study conversion of electrical energy into strain energy in glass, plastic, and metal samples that had been either irradiated by the electromagnetic waves emitted by the wire or enveloped by plasma formed by the wire. The strain energy left permanent marks on the sample in the form of discoloration, weight loss, erosion, and surface cracks. These were used to confirm the theoretical analysis as to method and to dimensions. Thus, a new method for measuring absorption coefficients was demonstrated. For glass samples, the surface crazed to a depth of 0.001 cm. Photomicrographs and profilometer measurements of the surface are presented to support the following conjectures as to the cause of cracking: the energy radiation by the hot wire is absorbed by a thin surface layer of the glass, the associated temperature rise generates thermal stresses, flaws below the glass surface form stress raisers according

to the Griffith crack theory, and the cracks subsequently propagate to the surface. The theoretical derivation of the adapted thermoelastic stress theory predicts the dimensions of the cracks and the power levels required if the absorption coefficient is at least 10(3) reciprocal centimeters. Thus, a cracking phenomenon has been postulated and verified experimentally. The resistance of the exploding wire was measured empirically, and a theoretical justification made of its variation. This study added to a characterization of the exploding wire along with spectral, calorimetric, and photographic studies. (Author)

AD-616 385 Div. 7/1, 4/4
CFSTI Prices: HC$2.00 MF$0.50

Rocketdyne, Canoga Park, Calif.
HIGH-ENERGY BATTERY SYSTEM STUDY.
Quarterly progress rept. no. 6, 1 Oct-31 Dec 64,
by J. Farrar, R. Keller, and M. M. Nicholson.
31 Dec 64, 27p Rept. no. R-5405-6
Contract DA36 039AMC03201E, Proj. 1C6 22001A053,
Task 1C6 22001A053 02
ECOM 03201-6
Unclassified report

See also AD-435 627.

Descriptors: (*Primary cells, Electrochemistry), (*Batteries + components, Electrolytes), Cathodes-(Electrolytic cells), Lithium compounds, Bromides, Alkenes, Carbonates, Silver compounds, Oxides, Reduction(Chemistry), Potassium compounds, Sodium compounds, Sulfates, Phosphates, Copper compounds, Iodates, Fluorides, Chlorides.

The behavior of high-energy cathode systems in lithium bromide-propylene carbonate electrolyte was investigated by galvanostatic polarization curves and prolonged discharge tests. An effort was made to promote the reduction of silver (II) oxide in the organic medium by means of additives that could act as receivers for the oxide ion. Water at concentrations of up to 10 percent was not effective for this purpose. Three solid oxygen receivers, K2S2O7, Na2S2O5, and Na4P2O7, did not improve the cathodic behavior of silver oxide. Other cathode materials investigated were cupric iodate, potassium persulfate, cupric fluoride, and (as a comparison system) silver chloride. The iodate and persulfate were inactive in the propylene carbonate electrolyte, but apparent utilization efficiencies of 31 and 70 percent were achieved for the reduction of cupric fluoride and silver chloride, respectively. (Author)

11. Materials

AD-615 774 Div. 14/3
CFSTI Prices: HC$3.00 MF$0.75

Olin Mathieson Chemical Corp., New Haven, Conn.
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID.
Final rept. for 11 May 64-10May 65,
by E. H. Kober, H. F. Lederle, G. F. Ottmann, J. E. Pregler, and S. A. Kolback. 28 May 65, 56p
Contract NObs90268

Unclassified report

Descriptors: (*Hydraulic fluids, Synthesis(Chemistry)), Flammability, Phosphines, Aromatic compounds, Amines, Halides, Phenols, Polycyclic compounds, Fluorine compounds, Alcohols, Glycols, Additives, Viscosity, Corrosion, Wear resistance, Foams, Antioxidants, Autoignition, Crystallization, Solubility.

A number of new base stocks for water-base hydraulic fluids was prepared and evaluated. The most promising materials - addition products of ethylene oxide and glycidol to bicyclic aromatic amines and phenols - were formulated with water soluble pour point depressants, viscosity index improvers, anti-wear agents, rubber swellers and anti-foam agents. These fluids pass the proposed target specifications. Judged by Falex tests, they exhibit considerably better anti-wear properties than a currently used MIL-H-22072 (Wep) fluid. (Author)

AD-615 781 Div. 17/6, 26/1
CFSTI Prices: HC$2.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
FRACTURE TOUGHNESS OF X7006-T6351 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
Final rept.,
by A. T. D'Annessa. Jul 64, 27p
Rept. no. 6-62-64-10

Unclassified report

Descriptors: (*Aluminum alloys, Fracture(Mechanics)), (*Fracture(Mechanics), Aluminum alloys), (*Welds, Aluminum alloys), Toughness, Metal plates, Tests.

The report is concerned with the 'precracked-Charpy' fracture toughness evaluation of 3/4 in. X7006-T6351 plate and its weldments. Fracture toughness, (W/A)sub c, data at room temperature and LN sub 2 temperature are presented for (1) four principal notch orientations in the base-metal and (2) two weld fusion zone directions to assess resistance to longitudinal and transverse weld cracking. The variation of fracture toughness of sub-thicknesses of the basic plate thickness in both the base metal and weld fusion zone is determined by using varying width 'through-thickness' notched specimens. 'Through-thickness' notch data are used to calculate critical-crack size for two base-metal and two weld-fusion zone orientations. Critical-flaw sizes are calculated for both room-temperature and LN sub 2 temperature. The fracture toughness of the X7006 alloy is compared with that of the X7039 alloy reported in an earlier report. (Author)

AD-615 786 Div. 17/5, 17/6
CFSTI Prices: HC$3.00 MF$0.75

Syracuse Univ., N. Y. Research Inst.
CRACK INITIATION IN METALLIC MATERIALS.
Final rept.,
by V. Weiss, G. Nash, and K. Schroder. Mar 65, 55p
Rept. no. MET-E-1160-0365F
Contract NOw64 0275d

Unclassified report

Descriptors: (*Fracture(Mechanics), Alloys), (*Steel, Fracture(Mechanics)), (*Titanium alloys, Fracture-(Mechanics)), Stainless steel, Chromium alloys, Nickel alloys, Molybdenum alloys, Carbon alloys, Cobalt alloys, Aluminum alloys, Manganese alloys, Vanadium alloys, Loading(Mechanics), Fatigue(Mechanics).

Crack initiation and propagation under altering loading has been investigated for a number of technical alloys (AISI 301, PH-15-7Mo, D6-AC, HP9-4-25, Ti-6A1-4V). The parameters n(+) and N sub o relating to the crack propagation and initiation respectively have been introduced through the use of a crack propagation law suggested by Weiss and have been correlated with the specimen geometries and material properties. The parameter n(+) is thought to depend in some way on the strain hardening coefficient of the material and is found to provide an indication of the material's resistance to fatigue crack propagation. The parameter N sub o is related to the crack initiation times and a relation between N sub o, the geometry of the specimen, and the parameter n(+) has been proposed. (Author)

AD-615 789 Div. 17/6, 17/2, 26/1
CFSTI Prices: HC$4.00 MF$0.75

Alcoa Research Labs., Aluminum Co. of America, New Kensington, Pa.
INVESTIGATION OF THE MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
Final rept. for 6 Dec 63-6 Feb 65,
by G. C. English. 6 Feb 65, 103p
Contract Now64 0170c

Unclassified report

See also AD-608 842.

Descriptors: (*Aluminum alloys, Corrosion), (*Cathodic protection, Aluminum alloys), (*Corrosion, Stresses), Corrosive liquids, Metal plates, Heat treatment, Microstructure, Failure(Mechanics), Metallography.

The cathodic protection of 7075 alloy in a corrosive, acid chloride solution was investigated. Subsize tensile specimens for protection were taken in the short-transverse direction from 2-inch thick plate in two tempers, one (-T6) susceptible to stress corrosion and one (-T73) not susceptible to this type of corrosion. In the solution used a susceptible specimen stressed to 75% of its yield strength failed by stress corrosion in an hour while a stresses non-suspectible specimen failed by general corrosion within two days. At a potential 0.57 volts negative to the free corrosion potential, a stressed susceptible specimen could be protected for an indefinitely long period; one susceptible specimen stressed to 75% of its yield strength and held at this potential for 400 hours showed no evidence of stress corrosion. This potential of cathodic protection appeared to be independent of the stress applied to a specimen. Considerable evidence indicates that the potential reflected metallurgical structure rather than extraneous conditions such as the alkalinity produced by cathodic reactions. (Author)

AD-615 807 Div. 14/2, 26/1, 26/4
CFSTI Prices: HC$1.00 MF$0.50

Army Electronics Command, Fort Monmouth, N. J.
CONTROL AND REPRODUCIBILITY OF FERRITES PREPARED BY THE FLAME SPRAY-HOT PRESS TECHNIQUE,

by Richard W. Babbitt and Walter W. Malinofsky.
Apr 65, 22p Technical rept. ECOM-2563
Proj. 1C0 24401A112 02, Task 1C0 24401A112 02 05
Unclassified report

Descriptors: (*Ferrites, Manufacturing methods), Flame spraying, Hot working, Ferromagnetic materials, Powders, Magnetic properties, Nickel compounds, Zinc compounds, Preparation, Quality control, Density, Particle size.

The flame spray and hot press apparatus are described. Various flame spray parameters and their effects are discussed. Reproducibility of physical and magnetic properties of ferrites due to the hot press alone and the flame spray-hot press combination are presented. It is shown that reproducibility by this technique compares favorably with conventional techniques. (Author)

AD-615 809 Div. 14/2, 25/2
CFSTI Prices: HC$2.00 MF$0.50

New York State Coll. of Ceramics, Alfred Univ.
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
Bimonthly progress rept. no. 3, 1 Feb-1 Apr 65,
by J. E. Funk, J. Nemeth, and J. R. Tinklepaugh.
1 Apr 65, 26p
Contract NOw65 0131d
Unclassified report

See also AD-611 880.

Descriptors: (*Strontium compounds, Zirconates), (*Zirconates, Mechanical properties), (*Crystal structure, Zirconates), Additives, Calcium compounds, Rupture, Solid solutions, Tensile properties, Thermal expansion, Anisotropy, Hafnium compounds, Oxides, Refractory materials, Fracture(Mechanics), X-ray diffraction analysis.

An addition of 15 Mol. % calcium zirconate to strontium zirconate results in a material that has a modulus of rupture of about 27,800 psi as compared to strontium zirconate at 13,000 psi. This solid solution also exhibits the yield characteristics previously observed in strontium zirconate. Research has continued on the strengthening of strontium zirconate by various cation additions. The thermal expansion characteristics in the various crystallography axis have been carefully examined and it is concluded that sufficient anisotropy does not exist to cause microcracks in strontium zirconate. Strontium hafniate has been synthesized and is being examined. (Author)

AD-615 817 Div. 14/6, 14/2, 26/1
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Philadelphia, Pa. Missile and Space Div.
INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
Quarterly rept. no. 2, 1 Oct-31 Dec 64,
by Willard H. Sutton and Earl Feingold. Mar 65, 32p
Contract DA19 066AMC184X, Proj. DA1A02440A110
AMRA CP-63-01/2 Unclassified report

Descriptors: (*Composite materials, Bonding), (*Ceramic fibers, Reinforcing materials), (*Reinforcing materials, Ceramic fibers), Nickel, Sapphires, Single crystals, Surface-active substances, Aluminum compounds, Oxides, Fiber metallurgy, Chromium alloys, Titanium alloys, Zirconium alloys, Nickel alloys, Surface properties, Electron microscopy, Microscopy, X-ray spectroscopy, X-ray diffraction analysis, Degradation, Microstructure.

The character of wetting and bonding between single crystal sapphire (alpha-Al2O3) and sessile drops of nickel doped with 1 atomic percent of chromium, titanium or zirconium was studied. Bonding in these systems was found to proceed in the following manner: (a) segregation of the active metal, (b) concentration of the active metal at the interface, (c) reaction of active metal with the sapphire substrate, (d) formation of new crystalline phases at the interface, with (e) diffusion of the active metal into the sapphire. Detailed investigations of metal/sapphire interfaces were conducted using the methods of x-ray diffraction optical and electron microscopy and microhardness. An hypothesis for the mode of bond failure relating to the nature of the underlying sapphire surface is presented. Differences between true interfacial bonding and 'engineering bonding' were noted and are described. (Author)

AD-615 823 Div. 17/5, 30/5
CFSTI Prices: HC$2.00 MF$0.50

Frankford Arsenal, Philadelphia, Pa. Research and Development Directorate.
DETECTION AND EVALUATION OF SURFACE DECARBURIZATION OF STEEL COMPONENTS BY MEANS OF ROCKWELL HARDNESS TEST PROCEDURES,
by B. J. Rogus. Apr 65, 48p Test rept. T65-13-1
Unclassified report

Descriptors: (*Steel, Surface properties), (*Test methods, Hardness), Carbon, Non-destructive testing, Carbon alloys.

A test procedure is outlined which permits detection and evaluation of surface decarburization on steel. The procedure consists of making a series of Rockwell hardness tests on the specimen surfaces using several Rockwell test scales. Evaluation of the surface decarburization is made by comparing values obtained for either Rockwell D, A, 15N, 30N, or 45N test scales with values anticipated for these scales. The anticipated values are derived by means of Rockwell C tests made on the test surface and hardness conversion tables. The procedure is based on the difference in depth of Rockwell indentations between tests of different loads. Surface decarburization usually results in a progressive lowering of hardness levels from the component interior to the decarburized surface. Therefore, indentations of different depths, resulting from different test loads, reflect related variations in strength levels. With proper use, the described method will prove helpful in the detection and evaluation of surface decarburization conditions present on steel component items made of plain carbon steel. (Author)

AD-615 852 Div. 14/8, 10/6, 27/3

Stevens Inst. of Tech., Hoboken, N. J.
LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
Revised ed.,
by Robert F. McAlevy, III and James G. Hansel.
12 Nov 64, 8p
Contract Nonr26348, Proj. NR092 512
Unclassified report

Pub. in AIAA Journal p244-9 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thermoplastics, Pyrolysis), (*Acrylic resins, Pyrolysis), (*Styrene plastics, Pyrolysis), (*Hybrid rocket propellants, Combustion), Rocket motors(Solid propellant), Exhaust gases, Chlorine, Nitrogen, Oxygen, Perchloryl radicals, Fluorides, Nitrogen compounds, Sulfur compounds, Oxides, Ammonia, Hydrochloric acid, Porous materials, Test methods, Molecular structure, Surfaces, Chemical reactions.

The surface pyrolysis rate of two common thermoplastics, polystyrene (PS) and polymethyl-methacrylate (PMM), was measured in inert and chemically reactive environments, using the exhaust gas of a small rocket motor as a source of intense surface heating. Small plastic beads were employed to fabricate porous plastic specimens through which metered quantities of ten selected gases individually were passed; this novel porous plug technique permitted close experimental control of test gas concentration at the site of degradation. At a constant surface heating exposure (approximately 20 cal/sec-cm sq) the pyrolysis rate of PMM was unaffected by all ten, whereas that of PS was accelerated equally by both Cl2 and NO2. It is hypothesized that the acceleration is a result of Cl and NO2 substitutions in the PS chains, primarily at the tertiary hydrogen locations, thereby creating 'weak links' that enhance thermal degradation. In direct conflict with previous bulk degradation results of others, the presence of ClO3F, O2, and other less chemically reactive gases did not accelerate the surface degradation of PMM or PS; a rational basis for resolving this paradox is presented. (Author)

AD-615 865 Div. 14/8, 4/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SYNTHESIS AND INVESTIGATION OF PROPERTIES OF CERTAIN HOMOGENEOUS AND MIXED POLYBENZIMIDAZOLES,
by V. V. Korshak and T. M. Frunze. 5 May 65, 11p FTD-TT-64-1356
TT 65-62389

Unclassified report

Unedited rough draft trans. of Vysokomolekulyarnye Soedineniya (USSR) v6 n7 p1251-5 1964.

Descriptors: (*Heat-resistant plastics, Benzimidazoles), (*Benzimidazoles, Polymers), Synthesis(Chemistry), Condensation reactions, Carboxylic acids, Esters, Polymerization, Organic phosphorus compounds, Fluorine compounds, Thermal properties, Viscosity, Mechanical properties, Solubility, USSR.

The synthesis of a number of homogeneous and mixed polybenzimidazoles was carried out and their properties were investigated. The polybenzimidazoles were prepared by polycondensation of 3,3'-diaminobenzidine with the diphenyl esters of the following dicarboxylic acids: isophthalic, terephthalic, sebacic and bis-(p-carboxyphenyl)methylphosphinic oxide. An attempt was also made to obtain fluorine - containing polybenzimidazole from the same tetramine and diphenyl perflouroadipate. (Author)

AD-615 876 Div. 17/2, 17/5
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION,
by V. M. Finkel, P. I. Krotenok, and A. M. Savelev. 7 May 65, 13p FTD-TT-65-19
TT 65-62402

Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Chernaya Metallurgiya (USSR) v6 n6 p130-7 1963.

Descriptors: (*Steel, Metallography), (*Fractography, Steel), (*X-ray photography, Steel), (*Fracture-(Mechanics), Steel), USSR, Propagation, Surfaces, Deformation, Temperature.

The purpose of this investigation was to study fracture of steel in a flat widely converging microbundle at various temperatures from +20 to -180C by interference fractography and roentgenography.

AD-615 909 Div. 14/8, 4/3, 4/4
CFSTI Prices: HC$6.00 MF$1.25

Syracuse Univ., N. Y. State Univ., Coll. of Forestry.
SOME PROPERTIES OF STIFF MACROMOLECULES. I. MOLECULAR DIMENSIONS OF A WORM-LIKE CHAIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
Doctoral thesis,
by Ralph Cummings. Jun 65, 206p
Grant DA ORD26
AROD 2785:1

Unclassified report

Descriptors: (*Polymers, Molecular structure), (*Molecular properties, Polymers), (*Nitrocellulose, Hydrodynamics), Statistical processes, Pseudo-random systems, Viscometers, Viscosity.

Part I. The experimental molecular dimensions for polymers obtained by direct averaging over a large number of chains offers experimental proof of the validity of the expressions for <1/r> and < r squared >, where this expression is the mean square end-to-end distance of the chain, based on worm-like statistics. The values of <r> are assumed to be correct based on the behavior of <1/r> but the values of <1/r squared> are considered as approximations due to an error of < 20 percent in the averaging process for <r squared>. An expression is given which corrects the <r squared> to the theoretical value while the <1/r squared> correction is estimated graphically. Part II. Cellulose trinitrate in n-butyl acetate was shown to approach rod-like behavior at low molecular weights and to become more flexible as the molecular weight increased from considerations based on both viscosity and sedimentation. The approximate points at which the transitions to rod-like and Gaussian behaviors occur could only be estimated as less than 100,000 and greater than 500,000, respectively, although these are in range of the transition points found for cellulose trinitrate in other solvents. The dimensions calculated for the rod-like model are generally in poor agreement with the dimensions calculated from the Kurata-Stockmayer Theory.

AD-615 917 Div. 17/2, 25/2
CFSTI Prices: HC$1.00 MF$0.50

Martin Co., Orlando, Fla.
THE FORMATION, BEHAVIOR, AND PROPERTIES OF STACKING FAULTS IN CRYSTALLINE MATERIALS,
by Henry M. Otte. Oct 64, 8p
Contract Nonr370600

Unclassified report

Descriptors: (*Crystal lattice defects, X-ray diffraction analysis), (*X-ray diffraction analysis, Crystal lattice defects), Bronze, Silicon alloys, Brass, Stresses, Crystal structure, Strain(Mechanics), Particle size, Electron diffraction analysis, Metal films, Graphite, Carbon, Cerium, Crystal lattices, Chromium alloys, Rhenium alloys.

A review is given of the status of investigations at the end of the year, the primary approach still being X-ray techniques. The investigations included (1) determination of fault probability in the presence of applied or residual tensile stress for alpha brass in tension where the probability for a given strain is low (AD-602 114); (2) X-ray diffraction from niobium and tantalum deformed by wire drawing; (3) peak shifts

caused by layer faults in Cr-1 Re and Cr-35 Re alloys; (4) X-ray diffraction from explosively deformed silicon bronze where line broadening appears to be caused by particle size not strain; (5) methods for calculation of electron diffraction patterns containing twin reflections; (6) elliptical diffraction patterns from faults in graphite; (7) possible standardization of crystallographic formulas for hexagonal lattices; and (8) extrinsic faults for cerium deformed (by filing) at room temperature as shown by peak shifts.

AD-615 926 Div. 17/7, 17/2
CFSTI Prices: HC$2.00 MF$0.50

Stanford Univ., Calif. Dept. of Materials Science.
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER,
by C. R. Barrett, J. L. Lytton and O. D. Sherby.
1 May 65, 33p Technical rept. no. TR-7, SU-DMS-65-22
Contract Nonr22560, Proj. NR031 682
Unclassified report

Descriptors: (*Copper, Creep), (*Creep, Copper), High temperature research, Grain structures(Metallurgy), Heat treatment, Particle size, Grain boundaries, Strain(Mechanics).

Randomly oriented polycrystalline copper of 99.995% purity was tested in tension at temperatures of 626, 496 and 406C. The grain size range investigated was from 0.03 mm to 0.7 mm. Grain sizes were produced by two techniques: (1) varying the amount of prior cold work and the annealing time at constant annealing temperature so as to obtain various recrystallized grain sizes with minimum grain growth and (2) holding the prior cold work constant while varying the annealing time or temperature so as to obtain varying grain sizes by grain growth. Polycrystalline samples (grain size of 0.03 mm) with a strong (001) (100) texture were also studied. The relationship between the steady state creep rate, and grain size was found to be the same independent of the technique used to prepare the various grain sizes. For specimens with grain diameters above 0.1 mm, the steady state creep rate appeared to be independent of grain size while for smaller grain diameters, the steady state creep rate increased slightly with decreasing grain size. Strongly textured polycrystalline copper, which contained low angle grain boundaries, exhibited steady state creep rates that were slightly lower than those observed in randomly oriented copper of the same grain size. The results are explained by considering the contribution of grain boundary shearing to the total strain and the effect of grain size on the resulting creep substructure. (Author)

AD-615 927 Div. 17/3, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Stanford Univ., Calif. Dept. of Materials Science.
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES,
by R. M. Bonesteel and O. D. Sherby. 1 May 65, 22p Technical rept. no. TR-8, SU-DMS-65-23
Contract Nonr22560, Proj. NR031 682
Unclassified report

Descriptors: (*Brass, Creep), (*Creep, Brass), Stresses, Heat of activation, Copper alloys, Zinc alloys, Diffusion, Elasticity, Crystal lattice defects, High-temperature research.

The steady state creep behavior of three compositions of alpha-brass (90, 80, and 70 A/O copper) was investigated in the temperature range 550 to 700 C. Compressional creep testing was performed in dry, deoxidized hydrogen at stresses of 2800, 3400 and 4000 psi. Activation energies for creep were observed to be 38,600, 38,000 and 31,000 cal/mole for alloys containing 90, 80 and 70 A/O copper, respectively. As these values closely approximate chemical diffusion activation energies, it is thought that the rate controlling mechanism in creep of alpha-brass in the stress and temperature range studied is diffusion dependent. (Author)

AD-615 941 Div. 17/5, 17/2, 14/7
CFSTI Prices: HC$0.75 MF$0.50

Rock Island Arsenal, Ill.
CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS,
by Linden H. Wagner. 21 Dec 64, 26p
Rept. no. 64-3580
Proj. X 076502 9001
Unclassified report

Descriptors: (*Steel, Corrosion inhibition), (*Coatings, Oxides), (*Corrosion inhibition, Steel), Stainless steel, Oxidation, Processing, Sodium compounds, Hydroxides, Nitrites, Chromate, Electrodeposition, Chromium, Solutions, Salt spray tests, Effectiveness.

The various processes were reviewed and evaluated for their effectiveness in blackening mild steel, 300 and 400 corrosion resistant steels. The corrosion resistance of these coatings were also investigated. A low temperature Class 4 proprietary alkaline-oxidizing process was proposed for blackening only the 300 series stainless steels in lieu of the fuzed salt oxidizing process which operates at 760F. The Class 2 alkaline-chromate process did not blacken the 300 series stainless steels. Class 3 and Class 4 processes did. The mild steel control panels, coated and uncoated, failed the salt spray test in one hour. The electrodeposited coating failed in three to four hours. Freshly abraded control stainless steel panels 302, 310 and 321 were without rust after 500 hours. Proprietary coatings A-1 and B applied to freshly abraded 302 and 310 series stainless steel panels were without rust after 500 hours. On the 321 series stainless steel panels, initial rust was noted on Coating A-1 after 165 hours and on Coating B after 141 hours. The 300 series stainless steels specimens coated with the type 3 (molten dichromate process) failed in the salt spray test in one hour. (Author)

AD-615 982 Div. 14/4, 14/8
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES),
by N. M. Beder, A. B. Pakshver, L. F. Balakleitseva, A. I. Koratskaya, and G. I. Kudryavtsev. 13 May 65, 25p
FTD-TT-65-22
TT 65-62408
Unclassified report

Unedited rough draft trans. of Khimicheskie Volokna (USSR) n3 p6-9, 31-4 1963.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Fibers(Synthetic), Scientific research), (*Acrylonitrile polymers, Fibers(Synthetic)), (*Polyamide plastics, Fibers(Synthetic)), Preparation, Esters, Polymers, Physical properties, Mechanical properties, Polymerization, Sulfates, Sulfites, Bases(Chemistry), Acids, Glycols, USSR.

Contents (Translations from Russian periodical): Effect of polymer properties on the physico-mechanical properties of poly-acrylonitrile fiber
Polyamide esters and fibers on their base.

AD-616 045 Div. 17/2, 25/2

Northwestern Univ., Evanston, Ill.
GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS,
by N. R. Adsit and J. O. Brittain. 20 Apr 64, 7p
Contract AF49 638 780, Proj. 9761
AFOSR 65-0768
Unclassified report

Pub. in Transactions of the Metallurgical Society of Aime v233 p305-9 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Zinc, Grain boundaries), (*Grain boundaries, Zinc), Crystals, Deformation, Creep, Controlled atmospheres.

A number of zinc bicrystal specimens with the grain boundary loaded in simple shear were plastically deformed in creep in a vacuum at 200 C and under an argon atmosphere at 350C. The results indicated that the amount of grain boundary sliding at a given time was controlled by the slip in the grains and was proportional to the resolved shear stress on the slip plane. Curves of grain boundary sliding vs time were found to be cyclic with no regular periodicity. (Author)

AD-616 046 Div. 14/2, 25/2

Northwestern Univ., Evanston, Ill. Dept. of Materials Science.
SOLID SOLUTION AND PRECIPITATION HARDENING IN Mg-Fe-O ALLOYS,
by G. W. Groves and M. E. Fine. 8 May 64, 9p
Grant AF AFOSR327 63
AFOSR 65-0785
Unclassified report

Pub. in Journal of Applied Physics v35 n12 p3587-3593 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ceramic materials, Phase studies), (*Hardening, Ceramic materials), Crystals, Solid solutions, Dispersion hardening, Magnesium compounds, Oxides, Iron alloys, Magnesium alloys, Diffusion, Microstructure, Heat treatment, Crystal structure.

Iron was introduced into single crystals of MgO by diffusion to produce thin homogeneous slices of alloy crystals containing up to approximately 4% Fe/Mg+Fe). When the iron is present as Fe(2+) the MgO crystal is not appreciably strengthened but 1% Fe(3+) retained in solution by quenching approximately doubles the flow stress of the original crystal. The strengthening due to Fe(3+) can be enhanced slightly by aging the crystal in air at 700 to 1000 C. This causes a precipitate of magnesioferrite to form as octahedra which are perfectly oriented within the MgO, the faces of the octahedra being parallel to (111) in the MgO. The fracture process is not greatly affected by the presence of this 'coherent' precipitate. Continued aging reduces the strength and coarsens the precipitate without change in shape over a size range of 100 A to 1 micron.

AD-616 054 Div. 17/2, 25/6

California Univ., La Jolla.
SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM,
by C. J. Raub and U. Zwicker. 13 Aug 64, 2p
Grant AF AFOSR631 64, Proj. 9763, Task 976302
AFOSR 65-0790
Unclassified report

Research done in cooperation with Forschungsinstitut fuer Edelmetalle und Metallchemie, Schwaebish-Gmuend, Germany.
Pub. in Physical Review v137 n1A pA142-3 Jan 4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductivity, Titanium alloys), (*Titanium alloys, Superconductivity), Solid solutions, Vanadium alloys, Niobium alloys, Tantalum alloys, Transition temperature, Metallography, Phase studies.

The superconductivity of alpha-Ti-V, alpha-Ti-Nb, and alpha-Ti-Ta alloys was investigated. Beta-filament contamination was avoided. A nearly linear increase in T sub c was found. There was no difference in the effect of V, Nb, or Ta. (Author)

AD-616 096 Div. 14/3, 4/3
CFSTI Prices: HC$2.00 MF$0.50

American Oil Co., Whiting, Ind.
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
Final rept. for 1 Apr 64-1 Jun 65,
by K. R. Bunting, A. M. Dobry, E. A. Swakon, P. C. Vienna, and L. W. Mixon. 1 Jun 65, 47p
Contract Nobs90267, Proj. SR001 03 01, Task 606
Unclassified report

Descriptors: (*Hydraulic fluids, Synthesis(Chemistry)), Lubricants, Polyethylene plastics, Potassium compounds, Organic phosphorus compounds, Phosphonic acids, Chromates, Molybdates, Corrosion inhibition, Shipborne, Physical properties, Flammibility, Toxicity, Sea water, Viscosity, Compatibility, Fire safety.

The object of the study was the development of a water-base hydraulic fluid which (1) yields a fire-resistant non-aqueous residue, (2) is compatible with materials of construction and sea-water contamination, (3) satisfactorily lubricates shipboard pumps, (4) presents no unusual storage or handling problems and (5) exhibits no toxicological hazards under conditions of use. Low-density polyethylene can be chlorophosphonated by reaction with phosphorus trichloride and oxygen. Hydrolysis and neutralization with potassium hydroxide yields products which satisfactorily thicken water and which have satisfactory fire-resistant properties. Potassium salts of low-molecular-weight phosphonic acids are satisfactory pour depressors for these fluids. Potassium chromate and potassium molybdate are effective corrosion inhibitors. The most promising formula is: 27% thickener, 30% potassium bis-hydroxymethylphosphonate, 2% potassium molybdate, and 41% water.

AD-616 097 Div. 14/9, 4/4, 14/8, 25/2
CFSTI Prices: HC$2.00 MF$0.50

Institute of Rubber Research, Univ. of Akron, Ohio.
MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS.
Rept. for 1 Jan-31 Dec 64,
by A. E. Fields, A. N. Gent, and V. V. Vickroy.
Apr 65, 42p
Contract AF33 657 10868, Proj. 7342, Task 734203
ML TDR-64-19 P2 Unclassified report

See also AD-605 377.

Descriptors: (*Polymers, Molecular structure), (*Polyethylene plastics, Physical properties), (*Isoprene, Crystallization), Polymerization, Radiation chemistry, Elasticity, Photoelasticity, Solvents, Deformation, Molecular weight, Optical properties, Tensile properties, Refraction, Crystal structure, Nucleation, Molecular isomerism.

Crosslinked samples of high molecular weight linear polyethylene have been prepared by irradiation in the molten state. The elastic and photo-elastic properties have been examined in simple extension. The rate of solvent uptake was studied and the equilibrium swelling determined in five solvents. The changes in tensile stress and birefringence were studied as stretched strips crystallize on cooling, or with time at a suitable temperature. Measurements of the density of nucleation and the radial growth rate of spherulites are reported for two materials, purified trans 1,4-polyisoprene, and the same material with about 9.5 per cent of the units isomerized to the cis form. Three distinct types of spherulite were observed, following different growth laws under identical conditions. The temperature dependences have been determined for the pure polymer; for the isomerized material the rates of growth were reduced by a factor of about 20 at the same crystallization temperature, although large, well-defined spherulites could be obtained. (Author)

AD-616 101 Div. 14/6, 1/5, 13/11
CFSTI Prices: HC$3.00 MF$0.75

National Engineering Science Co., Pasadena, Calif.
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS.
Rept. for Nov 63-Jan 65,
by H. Landesman, J. E. Basinski, and E. B. Klusmann.
Mar 65, 69p SN-170
Contract AF33 615 1161, Proj. 8119, Task 811932
APL TR-65-10
Unclassified report

Descriptors: (*Fire extinguishers, Materials), (*Halogenated hydrocarbons, Fire extinguishers), Flammability, Free radicals, Methane, Fire safety, Aviation safety, Fires, Flames, Inhibition, Hydrogen, Fuels, Additives, Feasibility studies, Catalysts.

The report presents results of a program to test the feasibility of synergistically enhancing the effect of halogenated fire extinguishants with addition of free radical initiators. Data are presented from screening for the synergistic enhancement effect by means of 1) flame speed measurements of hydrogen-air flames to which initiator-inhibitor mixtures are added, 2) flammability limits of heptane-air flames to which initiator-inhibitor mixtures are added, and 3) small scale pan fire tests using initiator-extinguishant mixtures. Results of the experimental program are discussed and attempts made to relate observations to known combustion phenomena. (Author)

AD-616 115 Div. 14/2, 25/4
CFSTI Prices: HC$2.00 MF$0.50

Texas Instruments, Inc., Dallas.
NEW HIGH TEMPERATURE INFRARED TRANSMITTING GLASSES.
Semiannual technical summary rept. no. 4, 1 Aug 64-30 Apr 65.
30 Apr 65, 30p Rept. no. TI-08-65-72
Contract Nonr381000 Unclassified report

Descriptors: (*Optical glass, Infrared optical materials), (*Infrared optical materials, Optical glass), (*Infrared windows, Optical glass), (*Glass, Infrared optical materials), High-temperature research, Chemical bonds, Mass spectroscopy, Spectrum analyzers, Refraction, Refractive index, Light transmission, Molecular weight, Density, Atomic properties, Phosphorus, Arsenic, Antimony, Silicon, Germanium, Selenium, Tellurium.

An investigation was made into the basic chemical and physical nature of the nonoxide chalcogenide glasses. The glasses are found to be covalently bonded solids in which the nature of the parent chalcogenide is largely preserved. Within a few percent, the densities are a linear function of the molecular weight calculated from the compositional formula. Molar refraction and refractive index can be estimated within a few percent from density, compositional formula, and the covalent radii of the constituent elements. The interatomic distances calculated from simple stretching vibrational frequencies are very close to the sum of the appropriate covalent radii. A study of the vapor over heated glasses of different compositions indicates the group VA elements (P, As, Sb) in ternary systems are only loosely held in the glass structure and are not bonded to the chalcogenides in the presence of group IVA (Si or Ge) elements. A radial distribution analysis of the intensity of scattered x-ray energy as a function of angle of incidence for Si-Te glasses indicates the presence of evenly spaced Te chains. Structural measurements so far have provided a qualitative understanding of the structural nature of all the chalcogenide glasses. (Author)

AD-616 263 Div. 17/2
CFSTI Prices: HC$1.00 MF$0.50

Engineering Mechanics Research Lab., Univ. of Texas, Austin.
CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE.
Scientific rept.,
by F. H. Tuley and M. A. Wilkov. Dec 64, 18p
EMRL-RM-1001
Grant AF AFOSR560 64
Unclassified report

Descriptors: (*Metal films, Deformation), (*Electron microscopy, Metal films), Silver, Nickel, Fatigue (Mechanics), Vapor plating, Electron diffraction analysis.

High purity silver and nickel films were obtained by vapor deposition onto a sodium chloride crystal in an ion pumped vacuum at a pressure greater than 10 to the -9th power Torr. Observations of the films in a Jem 150 electron microscope were made after floating the films off of the NaCl crystal and picking them up on a specimen grid while in the liquid. The electron micrographs showed dislocations, stacking faults and interference fringes present and that the films were not of uniform thickness. The results showed that metallic films could be obtained and that the attainment of films representative of the bulk material requires a refinement of the vapor deposition method under ultra-high vacuum conditions. A tensile device has been built to cyclically stress the films in the electron microscope and thereby study the motion of dislocations in the films and ultimately observe the fatigue crack. (Author)

AD-616 277 Div. 17/2
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy.

LOCAL ORDER IN LIQUID ALLOYS,
by Roy Kaplow, S. L. Strong, and B. L. Averbach.
11 May 65, 35p Technical rept. TR-6, DSR-7954
Contract Nonr184148

Unclassified report

Presented at AIME symposium, Chicago, Feb 65.

Descriptors: (*Liquid metals, Atomic properties), (*Gold alloys, X-ray diffraction analysis), (*Tin alloys, X-ray diffraction analysis), Eutectics, Intermetallic compounds, Crystal lattices, Melting, Oscillation, Statistical functions.

Although the complete measurement of the separate pair distribution functions in a liquid binary alloy requires three separate experiments utilyzing three different radiations, a significant amount of information can be obtained from single radiation experiments. Data and total distribution functions are presented for a series of gold-tin alloys and pure tin. Interpolations between the experimental results for .5 gold and pure tin accurately reproduce the results for the intermediate AuSn2 and AuSn4 alloys. An interpolation between the .5 gold result and an estimate of the pure gold distribution function also matches accurately the positions of the oscillations in the distribution function of the 0.7 gold eutectic alloy. A comparison between the experimental distribution function for the .5 gold liquid and a quasi-crystalline model indicates that the atomic arrangements in the equiatomic alloy are similar to those in the solid compound. It therefore appears that the atomic arrangement characteristic of the congruently melting equiatomic compound is partially preserved at all compositions in the liquid, and that the supressed compounds do not play a significant role in determining the liquid distribution functions. (Author)

AD-616 283 Div. 14/4, 14/8, 25/6
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE EFFECT OF ULTRAVIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS,
by V. R. Regel and N. N. Chernyi. 27 Apr 65, 16p
FTD-TT-64-1272
TT 65-62439

Unclassified report

Unedited rough draft trans. of Vysokomolekulyarnye Soedineniya (USSR) v5 n6 p925-31 1963.

Descriptors: (*Nylon, Ultraviolet radiation), (*Creep, Nylon), (*Ultraviolet radiation, Nylon), USSR, Fibers-(Synthetic), Deformation, Polymers, Elasticity, Chemical bonds, Decomposition.

The conclusion is drawn that the change in the rate of the established creep in the oriented fibers is brought about by the change in the rate of the breakdown of the chemical bonds, i.e., connected with the processes of disintegration.

AD-616 302 Div. 17/5
CFSTI Prices: HC$2.00 MF$0.50

IIT Research Inst., Chicago, Ill.
EMBRITTLEMENT OF METALS BY ORGANIC LIQUIDS.
Summary rept. for 1 Mar 64-31 Mar 65,
by W. Rostoker. 24 May 65, 35p IITRI-B183B2-8
Contract DA11 ORD022 3108
See also AD-610 358.

Unclassified report

Descriptors: (*Steel, Brittleness), (*Corrosive liquids, Organic compounds), Metals, Metalorganic compounds, Fatigue(Mechanics), Carbon, Dehydration, Water, Failure(Mechanics), Reviews, Tests.

The published literature on the subject is reviewed. The essential details of reduced fatigue life of steel in the presence of certain polar liquids discovered by Karpenko are confirmed. Studies on polar liquids and solutions were expanded to include a wider variety of long-chain organic species and a number of metallo-organic liquids. It is shown that fatigue life increases with increasing carbon shain length. In all cases the plot of fatigue life against carbon chain length extrapolates to the value for water. Further study has shown that in the presence of a strong dehydration agent, the embrittlement effect disappears. It is concluded that water content in solution is the fundamental factor governing the incidence of reduced fatigue life. However, the mechanism of failure in the presence of water is not clear. A number of experiments are described which suggest that current convictions are not tenable. (Author)

AD-616 308 Div. 14/7, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE,
by M. A. Shtern, N. E. Danyushevskaya, and O. V. Alekseeva. 14 May 65, 10p FTD-TT-65-55
TT 65-62441

Unclassified report

Unedited rough draft trans. of Lakokrasochnye Materialy i Ikh Primenenie (USSR) n1 p32-4 1964.

Descriptors: (*Phosphate coatings, Preparation), (*Pigments, Corrosion inhibition), (*Corrosion inhibition, Phosphate coatings), (*Chromium compounds, Phosphates), Antioxidants, Synthesis(Chemistry), USSR.

AD-616 322 Div. 14/9
CFSTI Prices: HC$1.00 MF$0.50

Rock Island Arsenal, Ill.
EVALUATION OF ETHYLENE PROPYLENE TERPOLYMER ELASTOMERS,
by Frank B. Testroet. Mar 65, 25p
Technical rept. no. TR-65-618
Proj. 1C024401A110

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Elastomers, Physical properties), (*Polyethylene plastics, Physical properties), Vulcanizates, Stresses, Strain(Mechanics), Stability, Plasticizers, Oils, Compatibility.

Commercial EPT elastomers were evaluated to ascertain their potential usefulness in military applications. It was found that EPT elastomers process easily and the resulting vulcanizates possess a unique combination of inherent qualities not available with other general purpose elastomers; i.e., low cost, good stress-strain properties, resistance to ozone attack and degradation caused by thermal oxidative processes coupled with excellent flexibility and resistance to embrittlement at temperatures of -55F. and -85F. respectively. Poor elastic recovery at low temperature is the most notable deficiency of these elastomers. Plasticizers produce an improvement in the good low temperature flexibility of EPT vulcanizates but

fail to improve elastic recovery. Plasticizers and process oils are readily compatible with EPT as evidenced by good stress-strain properties of vulcanizates highly extended with plasticizer or oil. Examples of high grade as well as highly extended, low cost compounds are presented. (Author)

AD-616 344 Div. 14/9
CFSTI Prices: HC$3.00 MF$0.75

Graduate Aeronautical Labs., Calif. Inst. of Tech., Pasadena.
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS.
Rept. for 1 May 63-31 Aug 64,
by M. L. Williams, W. M. Beebe, R. J. Arenz, and C. W. Ferguson. Mar 65, 68p GALCIT-SM-64-42
Contract AF29 601 5367, Proj. 5710
WL TR-64-155
Unclassified report

Descriptors: (*Isocyanate plastics, Photoelasticity), (*Photoelasticity, Isocyanate plastics), Mechanical properties, Optical properties, Sensitivity, Viscoelasticity, Strain(Mechanics), Stresses, Refraction.

A complete mechanical and optical characterization is given for Solithane 113, a urethane rubber compound having high birefringent sensitivity and excellent optical transmission properties. Its viscoelastic transition region is found to span about six decades of logarithmic time, somewhat narrower than other materials of the urethane family. The time-dependent orientation of the principal mechanical axes and optical axes is investigated for a circular Solithane specimen subjected to a rapidly changing diametric load situation. The results indicate the possibility of large phase lag of the optical axes orientation compared to principal stress axes. The agreement with principal strain axes is generally much closer but even here the phase angle can be as much as 45 degrees. (Author)

AD-616 346 Div. 17/4, 14/6, 12/1
CFSTI Prices: HC$7.25 MF$2.00

Plasmadyne Corp., Santa Ana, Calif.
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS,
by Shirley L. Grindle and James P. Todd.
Feb 65, 422p
Contract AF33 657 8476, Proj. 7381, Task 738103
ML TDR-64-293
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Reentry vehicles, Heat-resistant materials), (*Heat-resistant materials, Tests), Simulation, Space environmental conditions, Aerodynamic heating, Countermeasures.

Candidate materials for orbital and super-orbital re-entry vehicles were investigated, with prime emphasis on those materials applicable to the orbital re-entry vehicle. Other materials systems for application in leading edges, and various ASSET vehicle components were also investigated. The present performance limits of the hyperthermal plasma are facilities available at Plasmadyne Corporation for materials evaluation have been established through an extensive series of calibration tests. Operating capabilities of heat flux, enthalpy and pressure have been defined for various nozzles. (Author)

AD-616 352 Div. 17/2, 25/2, 30/5
CFSTI Prices: HC$3.00 MF$0.75

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION.
Final rept. for Mar 63-Jun 64,
by Alan lawley, John D. Meakin, and Kenneth U. Snowden. Jan 65, 61p
Contract AF33 657 10360, Proj. 7021, Task 702105
ARL 65-11
Unclassified report

Descriptors: (*Crystal lattice defects, Metals), (*Electron microscopy, Crystal lattice defects), (*Molybdenum, Fatigue(Mechanics)), (*Copper, Fatigue(Mechanics)), (*Aluminum, Fatigue(Mechanics)), Single crystals, Crystal lattices, Deformation, Crystal structure, Fracture(Mechanics), Metallography, Hardening.

Contents: Part I - The fatigue behavior of single crystal molybdenum; Part II - Cyclic strain behavior of copper and aluminum.

AD-616 389 Div. 17/4, 17/5, 17/6, 17/7, 14/6, 26/1
CFSTI Prices: HC$3.00 MF$0.75

Defense Metals Information Center, Columbus, Ohio.
DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS,
comp. by Carolyn A. Green. May 65, 74p
Contract AF33 615 1121, Proj. 8975
Unclassified report

See also AD-613 566.

Descriptors: (*Metallurgy, Bibliographies), (*Metals, Bibliographies), (*Materials, Bibliographies), Cobalt alloys, Nickel alloys, Steel, Iron alloys, Beryllium, Titanium, Magnesium, Aluminum, Non-metals, Refractory metals, Niobium, Molybdenum, Tantalum, Tungsten, Platinum, Coatings, Composite materials, Abstracting, Indexes, Material forming.

An annotated bibliography is given on high-strength alloys, light metals, nonmetallics, refractory metals, and miscellaneous materials.

AD-616 391 Div. 14/9
CFSTI Prices: HC$3.00 MF$0.75

Weston Observatory, Mass.
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 4485,
ed. by Ker C. Thomson. Mar 65, 86p
Scientific rept. no. SR-1
Contract AF19 628 212, Proj. 8652, ARPA Order 292
Task 865205, 2
AFCRL 65-358
Unclassified report

Descriptors: (*Isocyanate plastics, Photoelasticity), (*Elastomeres, Photoelasticity), (*Photoelasticity, Isocyanate plastics), Viscoelasticity, Optical properties, Shear stresses, Loading(Mechanics), Stresses.

A measuring program was conducted with the aim of determining the complete rheo-optical characterization of a certain urethane rubber compound (HYSOL 4485) suitable for dynamic photo-visco-elastic studies. The

shift curve and the master curve at 60F are presented for both the Shear Storage Modulus and the Shear Loss Tangent. In determining the shear properties sinusoidal loading of specimens cut as hollow cylinders was used. Using a method designed originally by Selway and Brown the dynamic stress optic coefficient and the complex Youngs Modulus were measured at room temperature.

The following tests were conducted in an atmosphere maintained at 70F and 40% R.H. Youngs Modulus in creep was measured at two stress levels: 20.0 and 41.7 p.s.i. Dynamic stress-strain curves were determined using Volterra pendulum tests at two initial velocities 7.02 and 65.5 inches per second; and the static and dynamic stress optic coefficients were measured. (Author)

12. Mathematical Sciences

AD-615 806 Div. 15/1
CFSTI Prices: HC$2.00 MF$0.50

RIAS, Inc., Baltimore, Md.
LINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS,
by Jack K. Hale. Mar 63, 44p
Technical rept. no. TR-63-6
Contracts AF49 638 382, NASr103
Unclassified report

Descriptors: (*Functional analysis, Differential equations), (*Differential equations, Functional analysis), Difference equations, Perturbation theory, Geometry, Operators(Mathematics).

AD-615 815 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

Operations Research Center, Univ. of Calif, Berkeley.
LAPLACE'S EQUATION AND NETWORK FLOWS,
by T. C. Hu. Feb 65, 23p ORC-65-2
Contract Nonr22283; Grant NSF GP2633
Unclassified report

Descriptors: (*Mathematical programming, Partial differential equations), (*Partial differential equations, Numerical methods + procedures), (*Numerical methods + procedures, Partial differential equations), Operations research, Boundary value problems.

This paper shows that partial differential equations may be a possible area of application of mathematical programming. The solution of Laplace's equation with Neumann's condition is shown to be a minimum cost network flow problem with cost proportional to the arc flow. An algorithm of solving minimum quadratic cost network flow is given. (Author)

AD-615 821 Div. 15/2, 30/2
CFSTI Prices: HC$5.00 MF$1.25

Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
SECOND ORDER PROPERTIES OF NONLINEAR SYSTEMS DRIVEN BY RANDOM NOISE,
by Lynn E. Wolaver. Apr 65, 199p ARL 65-61
Proj. 7071, Task 707103
Unclassified report

Rept. represents a substantial portion of the doctoral disertation submitted to the Univ. of Michigan, 1964.

Descriptors: (*Nonlinear systems, Statistical processes), (*Statistical processes, Nonlinear systems), Statistical functions, Control systems, Simulation, Numerical analysis.

The general objective of this study is to develop methods for finding the autocorrelation or spectral density of the output of certain second order nonlinear systems which are driven by a white Gaussian random process. Four distinct and separate methods are used. These are the areas of analytical methods using the Fokker-Planck-Kolmogorov approach, numerical technique with Markov chains, approximation techniques, and the experimental methods of direct simulation. An analytical expression is found for the autocorrelation of the output of a second order bang-bang system. An analytical bound is found for the absolute difference between the true and 'equivalent' linearized autocorrelation curves. Both analog and digital computers are used in direct simulation studies of nonlinear systems driven by random noise. (Author)

AD-615 848 Div. 15/2

Purdue Univ., Lafayette, Ind.
A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL,
by Shanti S. Gupta and Mrudulla N. Waknis.
1 Jul 64, 11p
Contract AF33 657 11737
Unclassified report

Pub. in Annals of Mathematical Statistics v36 n1 p139-49 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Inequalities, Special functions(Mathematical)), (*Special functions(Mathematical), Inequalities), (*Integrals, Inequalities), Continued fractions, Distribution theory, Decision theory.

In this paper a new set of inequalities and bounds for the incomplete gamma function are obtained. These inequalities and bounds are based on continued fraction expansions of the incomplete gamma function. Comparisons between the two sets of inequalities and some other known inequalities are made. Bounds are also obtained for the Mills' ratio for the normal integral and an analogue of Mills' ratio for the gamma distribution. Some other applications of these bounds to distribution theory problems arising in multiple decision theory are described. (Author)

AD-615 935 Div. 30/5, 15/1, 15/2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
NOTE ON A NEW COMPUTATIONAL DATA SMOOTHING PROCEDURE SUGGESTED BY MINIMUM MEAN SQUARE ERROR ESTIMATION,
by P. Swerling. May 65, 16p Rept. no. P-3151
Unclassified report

Descriptors: (*Numerical analysis, Data), (*Mathematical prediction, Errors), Statistical processes, Statistical data, Combinatorial analysis, Matrix algebra, Optimization, Iterative methods.

The form taken by minimum mean square error estimation procedures is investigated for the case where the dependence of the observed data on the parameters can, with good approximation, be considered to contain only constant, linear, and quadratic terms. The resulting procedures can be considered as alternatives to the iterative procedures used in least squares.

AD-615 946 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
DRAGGING ALONG AND INVARIANT DIFFERENTIATION,
by Dominic G. B. Edelen. Jun 65, 19p
Rept. no. RM-4546-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Invariance, Differential equations), (*Differential equations, Deformation), Transformations (Mathematics), Groups(Mathematics), Algebraic topology, Geometry, Field theory.

A physical system under coherent evolution will usually experience displacements of its constituent mass points,

and consequently a description of the fields generated by the mass points must include the effects of these displacements. A method is developed whereby derivatives of general geometric fields can be evaluated at the deformed mass points in terms of quantities evaluated at the original undeformed mass points. A general invariant derivative is defined which has a number of interesting properties in its own right. With this derivative and the Lie difference operator, relations between the dragged along invariant derivative and the invariant derivative of the dragged along field are derived. The point transformations that give rise to the dragging along are considered as finite point transformations, and hence the use of the exponential operator is obviated. Under restriction to infinitesimal deformations, the results reduce to the commutation relations between invariant differentiation and Lie differentiation. (Author)

AD-615 950 Div. 15/1
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
LIMIT THEOREMS INVOLVING CAPACITIES FOR RECURRENT MARKOV CHAINS,
by Sidney C. Port. Jun 65, 33p
Rept. no. RM-4580-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Potential theory, Probability), (*Probability, Potential theory), Measure theory, Invariance, Series, Numerical methods and procedures, Set theory, Theorems.

The asymptotic behavior of the quantity E(n) = The summation over all x of M(x) P sub x (V < or = n) is investigated in an irreducible, recurrent Markov chain, where M(x) is an invariant measure, and V is the hitting time of a finite nonempty set B.

AD-616 017 Div. 15/1

Harvard Univ., Cambridge, Mass.
DISCRETIZATION ERRORS FOR WELL-SET CAUCHY PROBLEMS.I.,
by Garrett Birkhoff and Richard S. Varga. 5 Nov 64, 23p

Unclassified report

Pub. in Journal of Mathematics and Physics v64 n1 p1-23 Mar 1965
Prepared in cooperation with Case Inst. of Tech., Cleveland, Ohio.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Partial differential equations, Errors), Functional analysis, Differential equations, Fourier analysis, Transformations(Mathematics).

AD-616 113 Div. 15/1, 8/7, 26/2
CFSTI Prices: HC$1.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa.
Graduate School of Industrial Administration.
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS.
Management sciences research rept.,
by Charles H. Kriebel. Apr 65, 18p
Rept. no. MSRR-33
Contract Nonr76024, Proj. NR047 048

Unclassified report

Revision of report dated Feb 65.

Descriptors: (*Mathematical models, Communication theory), (*Bibliographies, Communication theory), (*Communication theory, Data processing systems), Management control systems, Operations research, Documentation, Management planning, Computers.

This paper presents a cross-referenced bibliography on research employing mathematical models in the study of information systems. Although the listing in intended primarily as a representative introduction to the literature, the entries contain more than ten thousand secondary references. (Author)

AD-616 122 Div. 15/1
CFSTI Prices: HC$2.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
ON THE THEORY OF BOOLEAN FORMULAS: SUB-FORMULAS AND SUBSTITUTION OPERATORS.
Physical and mathematical sciences research papers,
by L. Calabi and E. W. Samson. May 65, 44p
Paper no. PMSRP-103, AFCRL 65-321
Proj. 4608, Task 460805

Unclassified report

Descriptors: (*Algebras, Theory), Operators (Mathematics), Mapping(Transformations), Mathematical logic.

Substitution operators for subformulas of Boolean formulas are introduced and investigated. This requires preliminary definition and study of subformulas, mediators (for a formal treatment of 'appearances'), and various related notions. Of particular importance for applications are the results concerning relations between substitutions, the Boolean operations, and the inclusion relation. (Author)

AD-616 194 Div. 15/2

Courant Inst. of Mathematical Sciences. New York Univ., N. Y.
A STRONG LAW FOR THE MAXIMUM CUMULATIVE SUM OF INDEPENDENT RANDOM VARIABLES,
by Warren M. Hirsch. Aug 64, 20p
Contract Nonr28538

Unclassified report

Pub. in Communications on Pure and Applied Mathematics v18 n1/2 p109-27 Feb-May 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Real variables, Theorems), (*Combinatorial analysis, Real variables), Stochastic processes, Measure theory, Distribution theory.

AD-616 278 Div. 15/1, 2/1, 25/6
CFSTI Prices: HC$1.00 MF$0.50

North Carolina State Coll., Raleigh.
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE,
by Thomas Gilmer Proctor. Jan 65, 25p
Technical rept. no. TR-1, PSR-26
Grant DA ARO D31 124G565, Proj. 20010501B700
AROD 4105;12

Unclassified report

Descriptors: (*Differential geometry, Theorems), (*Perturbation theory, Dynamics), Invariance, Mapping(Transformations), Hamiltonian, Functions.

In this report a theorem is proved establishing the existence of curves with analytic representation which are invariant under a certain analytic area preserving mapping. The mapping is a perturbation of a rotation or twist mapping and arises naturally in some undamped physical motions. This theorem modifies an invariant curve theorem proved by J. Moser to guarantee that there are 'analytic' curves invariant under the mapping and is an application of a technique for overcoming small divisors which was introduced by Kolmogorov in the study of perturbations of integrable Hamiltonian systems. (Author)

AD-616 301 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

Lincoln Lab., Mass. Inst. of Tech., Lexington.
SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS,
by H. S. Witsenhausen. 14 May 65, 16p
Technical note no. TN-1965-18
Contract AF19 628 500
ESD TDR-65-70
Unclassified report

Descriptors: (*Iterative methods, Boundary value problems), (*Boundary value problems, Iterative methods), Functional analysis, Nonlinear differential equations.

This report surveys three iterative methods which may be used to numerically solve nonlinear boundary value problems. (Author)

AD-616 324 Div. 15/2, 2/7
CFSTI Prices: HC$1.00 MF$0.50

Brown Univ., Providence, R. I.
EXTENSIONS TO THEORY OF TIME-SERIES ANALYSIS.
Quarterly rept. no. 11, 1 Feb-30 Apr 65,
by Walter Freiberger. 30 Apr 65, 8p
Contract DA36 039SC87222, Proj. 3A99 25 002
Unclassified report

See also AD-612 470.

Descriptors: (*Statistical analysis, Weather forecasting), (*Weather forecasting, Stochastic processes), Series, Mathematical models, Meteorological parameters.

AD-616 369 Div. 15/2
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
PARAMETER-FREE AND NONPARAMETRIC TOLERANCE LIMITS: THE EXPONENTIAL CASE.
Revised ed.,
by Leo A. Goodman and Albert Madansky. 1 Aug 61
40p Rept. no. P-1806-1
Unclassified report

Prepared in cooperation with Chicago Univ., Ill.
Revision of report dated 18 Sep 59.
Presented at the annual Meeting of the Institute of Mathematical Statistics, December 27-30, 1952.

Descriptors: (*Statistical distributions, Distribution theory), Statistical tests.

Exact parameter-free tolerance intervals based on the first r ordered observations from a sample of size n from an exponential distribution are developed. Various criteria for goodness of tolerance intervals are examined, and certain optimum properties of these intervals are demonstrated. The asymptotic behavior of these intervals is studied. Comparisons are made between these intervals and nonparametric tolerance intervals. Finally, the effect of assuming an exponential distribution, when in fact the distribution is a mixture of two exponentials, is discussed briefly. (Author)

AD-616 370 Div. 15/2

RAND Corp., Santa Monica, Calif.
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION b(r;N,p) FOR LARGE N AND SMALL p,
by D. S. Hopp and M. Warshaw. 13 Aug 59, 91p
Rept. no. P-1807
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Statistical distributions, Tables), (*Tables, Statistical distributions), (*Binomials, Distribution theory), Probability.

AD-616 371 Div. 15/1, 9/6, 19/3
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOME ASPECTS OF ADAPTIVE CONTROL PROCESSES,
by Robert Kalaba. 29 Sep 59, 19p Rept. no. P-1809
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Dynamic programming, Control systems), Optimization, Decision making, Stochastic processes, Feedback, Adaptive control systems, Automata, Economics, Differential equations, Difference equations, Probability, Calculus of variations.

AD-616 373 Div. 15/1

RAND Corp., Santa Monica, Calif.
ON A PHASE METHOD FOR TREATING STURM-LIOUVILLE EQUATIONS AND PROBLEMS,
by Nelson Wax. 5 Oct 59, 24p Rept. no. P-1812
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Iterative methods, Differential equations), (*Differential equations, Iterative methods), Boundary value problems, Integral transforms.

AD-616 377 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica. Calif.
SOME SPECIAL SEARCH PROBLEMS,
by O. Gross. 20 Oct 59, 18p Rept. no. P-1822
Unclassified report

Presented at Oct meeting of IRE Professional Group on Information Theory, 12 Oct 59, in Los Angeles.

Descriptors: (*Search theory, Game theory), (*Game theory, Search theory).

Intuitively, one thinks of a search problem as a puzzle requiring for its solution an efficient technique or algorithm for locating or gaining desirable information about some object. The object may be a physical one or perhaps purely mathematical in character. Without attempting to define precisely what is meant by a search problem per se, (this we leave to the Logicians) the author illustrates various categories and aspects, e.g., game theoretic, sequential minimax, etc., by means of particular typical problems he and his colleague Selmer Johnson, et. al., have solved at RAND. (Author)

AD-616 381 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
DYNAMIC PROGRAMMING AND CLASSICAL ANALYSIS,
by Richard Bellman. 28 Sep 59, 22p Rept. no. P-1804
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Dynamic programming, Theory).

Over the last ten years, research in the field of dynamic programming has assumed many different forms. Sometimes, the emphasis has been upon questions of formulation in analytic terms and concepts, sometimes upon the problems of existence and uniqueness of solutions of the functional equations derived from the underlying processes, occasionally upon the actual analytic structure of the solutions of these equations, sometimes upon the computational aspects; and sometimes upon the applications--to control processes, to trajectories of various types, to operations research, to mathematical economics. Inevitably, the result of this quasi-ergodic behavior has been to ignore a number of significant problems, and to treat a number of others in cavalier fashion. In this exposition, we wish to focus attention upon a number of interesting, difficult, and significant questions in analysis which arise naturally out of the functional equation technique of dynamic programming. Our aim is to show that this theory constitutes a natural extension of classical investigations and that the corresponding problems are natural generalizations of problems of classical analysis.

AD-616 390 Div. 15/1, 30/2
CFSTI Prices: HC$2.00 MF$0.50

Arcon Corp., Lexington, Mass.
REAL TIME COMPUTATION OF CONSTRAINED LEAST SQUARES ESTIMATORS,
by Arthur Albert and Robert W. Sittler. Jun 65, 37p
Contract Nonr490500
Unclassified report

Descriptors: (*Least squares method, numerical methods + procedures), Real time, Computers, Matrix algebra.

It is shown that linear constraints can be treated like observations with zero variance in least squares problems and, as a result, a minor modification of the method developed for the real time computation of (unconstrained) least squares estimators can be applied directly to the problem of weighted least squares estimation with constraints. (Author)

AD-616 401 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE RATIONAL POINTS ON A TRANSCENDENTAL CURVE,
by O. Gross. 2 Nov 59, 7p Rept. no. P-1831
Unclassified report

Descriptors: (*Transcendental functions, Rational numbers), (*Rational numbers, Transcendental functions), Irrational numbers, Algebra, Trigonometry.

A short elementary proof of the irrationality of (arctan p)/pi is given, where p is a positive rational number different from unity. (Author)

AD-616 408 Div. 15/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
FUNCTIONAL EQUATIONS IN THE THEORY OF DYNAMIC PROGRAMMING. XI: LIMIT THEOREMS,
by Richard Bellman. 30 Nov. 59, 7p Rept. no. P-1843
Unclassified report

Descriptors: (*Dynamic programming, Equations), (*Statistical processes, Decision theory), Theorems, Transformations(Mathematics).

A limit theorem is presented which is valid for a general class of Markovian decision processes. The result is of interest because of the simple conditions which are imposed and the argument used. (Author)

AD-616 410 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ON THE SEPARATION OF EXPONENTIALS,
by Richard Bellman. 11 Dec 59, 4p Rept. no. P-1846
Unclassified report

Descriptors: (*Functional analysis, Numerical methods and procedures), Sequences, Power series, Determinants, Mathematical prediction.

AD-616 427 Div. 15/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ASYMPTOTIC BEHAVIOR OF SOLUTIONS OF LINEAR PARABOLIC EQUATIONS,
by Richard Bellman and Kenneth L. Cooke.
6 Jan 60, 6p Rept. no. P-1870
Unclassified report

Descriptors: (*Partial differential equations, Integration), Integral equations, Functions, Series.

13. Mechanical, Industrial, Civil, and Marine Engineering

AD-615 784 Div. 13/4, 8/1
CFSTI Prices: HC$2.00 MF$0.50

Dresser-Ideco Co., Columbus, Ohio.
TOWER FOR MULTIPLATE ANTENNA.
Final engineering rept.,
by John K. Groseclose. Apr 65, 31p Rept. no. 2
Contract AF19 628 2977, Projs. 0000, 4600,
Tasks 000012, 460007
AFCRL 65-341

Unclassified report

Descriptors: (*Towers, Television antennas), Antenna masts, Performance(Engineering), Wind, Temperature, Data, Loading(Mechanics), Oscillation, Deflection.

The report describes the response of a 1000-foot guyed television tower to the environmental influences of wind and temperature. It compares the response data with data previously collected. The report includes a description of the apparatus and techniques used to record the data. (Author)

AD-615 791 Div. 13/4, 2/9
CFSTI Prices: HC$2.00 MF$0.50

Army Coastal Engineering Research Center,
Washington, D. C.
BEHAVIOR OF BEACH FILL AND BORROW AREA AT SEASIDE PARK, BRIDGEPORT, CONNECTICUT,
by William H. Vesper. Feb 65, 27p
Technical memo. no. TM-11

Unclassified report

Descriptors: (*Erosion, Beaches), (*Beaches, Maintenance), Connecticut, Economics, Construction, Sand, Distribution, Stabilization.

Comparative survey and sand sampling data are analyzed to determine the behavior of beach fill placed on the beach from an offshore borrow source. Over a 5-year period subsequent to initial placement, volumetric losses averaging about 14,000 cy/yr from the beach zone above MLW are nearly equalled by volumetric gains in the underwater zone of the profile, with only a comparatively small net volume (8,400 cubic yards for the 5-year period) indicated as net loss from the fill area. The borrow area, about 1,200 feet offshore, was concluded to be sufficiently distant to preclude inducement of offshore loss. Annual cost of providing and maintaining the authorized beach protection at Seaside Park is estimated at $3.35 per linear foot of shore protected. (Author)

AD-615 795 Div. 33/2, 2/5
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions Research and Engineering Lab.,
Hanover, N. H.
SNOW REMOVAL AND ICE CONTROL,
by Malcolm Mellor. Apr 65, 41p
Proj. IV025001A130

Unclassified report

Cold Regions Science and Engineering, Part III, Section A3b.

Descriptors: (*Snow removal, Transportation), (*Ice, Control), Northern Hemisphere, Climatology, Roads, De-icing materials.

This monograph summarizes current ideas and practice in snow removal and ice control as they affect means of transportation.

AD-615 797 Div. 26/4
CFSTI Prices: HC$1.00 MF$0.50

Copenhagen Univ. (Denmark).
THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPECTION BY ATTRIBUTES,
by A. Hald and P. Thyregod. Apr 65, 16p
Contract Nonr N62558 3073, Proj. NR042 225

Unclassified report

Descriptors: (*Quality control, Military requirements), (*Operations research, Quality control), Probability, Statistical analysis, Management planning, Denmark.

AD-615 820 Div. 26/6, 5/2, 7/5
CFSTI Prices: HC$2.00 MF$0.50

Rotron Mfg. Co., Woodstock, N. Y.
THE DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
Interim development rept. for 3 Feb-30 Apr 65.
28 May 65, 43p
Contract NObsr87522

Unclassified report

See also AD-613 032.

Descriptors: (*Blowers, Gas bearings), (*Gas bearings, Design), (*Radio transmitters, Gas bearings), (*Journal bearings, Gas bearings), (*Thrust bearings, Gas bearings), Electric motors, Stability, Performance-(Engineering), Drives, Shafts, Magnets, Loading-(Mechanics).

Investigations were conducted to determine the magnitude of electrical magnetic loads and their effect on hydrodynamic gas bearing load capacity and stability. Evaluations were also conducted to determine effect of shaft fabrication techniques on hydrodynamic gas bearing performance. The design and initial development of a gas lubricated blower containing magnetic thrust bearings suitable for cooling an AN/TED-9 radio transmitter is described. A transistorized converter for use in driving the blower motor is also discussed. (Author)

AD-615 853 Div. 13/4, 26/6
CFSTI Prices: HC$2.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command,
Wright-Patterson AFB, Ohio.
SOME CHIEF RESULTS OF INVESTIGATIONS ON THE APPLICATION OF REINFORCED CONCRETE IN HEAVY MACHINE BUILDING AND PRESS CONSTRUCTION,
by I. G. Lyudkovskii. 20 Apr 65, 47p
FTD-MT-65-55
TT 65-62376

Unclassified report

Edited machine trans. of mono. Primenenie Zhelezobetona v Mashinostroenii (Application of Reinforced Concrete in Machine Building), Moscow, 1964 p3-42. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Reinforced concrete, Foundations-(Structures)), (*Machine tools, Reinforced concrete),

Presses(Machinery), Machines, Structural parts, Design, Turbines, Structures, Mathematical analysis.

The article presents the design and manufacture of reinforced concrete beds of presses and stretch-straightener, basic parts of metal working machine tools and other machines; experimental investigations of main units of reinforced concrete machines, models of beds of full-scale samples; theoretical investigations and treatment of methods of calculation of complex massive components, reinforced concrete machines, and spiral chambers of reinforced concrete hydraulic turbines. Besides presentation of theoretical questions the collection gives practical approximate methods and examples of calculation. To facilitate calculation, supplementary tables and graphs are appended to the collection. (Author)

AD-615 880 Div. 26/1, 14/7
CFSTI Prices: HC$1.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
A METHOD OF SILVER PLATING GLASS BEADS.
Rept. for Jun-Aug 64,
by Lloyd E. Fox. Jan 65, 20p
Rept. no. CRDLR-3248
Task 1C522301A08402
Unclassified report

Descriptors: (*Metal coatings, Glass), (*Glass, Plating), (*Plating, Silver), (*Silver, Plating), Spheres, Formaldehyde, Diffusion, Silver compounds, Organic nitrogen compounds, Solutions, Reduction(Chemistry), Sodium compounds, Potassium compounds, Tartrates.

A chemical method is described for plating glass beads with a uniform coat of silver. The object of this work was to develop a technique of plating beads uniformly with a minimum of 6% by weight of silver while maintaining their smooth spherical shape. The method is based on the reduction of silver from an ammoniacal silver nitrate solution. Results using formaldehyde and sodium potassium tartrate as reducing agents are discussed. It is concluded that this chemical method may be used to plate glass beads with a uniform coat of silver. By this procedure, using sodium potassium tartrate, a smooth coat giving up to 7% silver by weight on beads having a mass median diameter of 32 microns can be obtained. (Author)

AD-615 881 Div. 26/7, 14/8, 18/3

Naval Air Engineering Center, Philadelphia, Pa. Aeronautical Materials Lab.
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS,
by I. H. Custis and D. V. Minuti. 28 Feb 62, 93p
NAEC-AML-1389
Task RREN ST201 200
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Packaging, Plastics), (*Plastics, Packaging), (*Films, Plastics), Transparent panels, Plastic seals, Feasibility studies, Performance-(Engineering), Military requirements, Specifications, Flexible structures, Tests.

An investigation of transparent, flexible, heat sealable films has been conducted to determine their use for packaging military equipment and components. The results of this investigation indicate the potential use of these films in military packaging as watervaporproof, waterproof, greaseproof, dustproof barriers where transparency is featured to facilitate periodic and acceptance inspection of the packaged item as well as ready identification of the packaged item without destruction of the protective system. Specifications have been developed to cover such films in roll form, sheet stock, and bags fabricated therefrom. Materials and fabrications covered by these specifications are intended for use in packaging military equipment such as aeronautical and missile components. (Author)

AD-615 882 Div. 31/3
CFSTI Prices: HC$1.00 MF$0.50

Marine Physical Lab., Univ. of California, San Diego.
THE MOTION OF A SPAR BUOY IN SWELL. PART I.
Internal Memo.,
by Philip Rudnick. 14 Jun 60, 4p
Rept. no. MPL-U-17/60
Contract Nonr221605
Unclassified report

Descriptors: (*Spar buoys, Motion), Ocean waves, Differential equations, Pressure, Force(Mechanics).

An investigation was made to achieve reduction of buoy motion relative to wave motion. Equations of motion for vertical motion are presented.

AD-615 883 Div. 11/5, 7/1, 7/5
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
ELECTRIC MOTOR CARS.
Memo.,
by George A. Hoffman. Mar 63, 59p
Rept. no. RM-3298-FF
Unclassified report

Descriptors: (*Passenger vehicles, Electric motors), Feasibility studies, Batteries + components, Fuel cells, Energy conversion, Nuclear energy, Thermionic converters, Thermoelectricity, Power equipment, Costs.

The electric automobiles studied are designed as the equivalent of their gasoline-engine counterparts in size, comfort, performance, and initial acceleration. Top speeds comparable to those of small present-day cars are shown to be realizable, though the range between refueling is not. Batteries are shown to be the most promising prospect for storing and delivering energy to the motor, achieving in some instances ranges up to 200 mi between battery recharges. On the other hand, fuel cells using inexpensive fuels, though affording much greater range, are shown to be too heavy at present for automotive use. Many appealing aspects of urban electric-auto use are listed, such as less air pollution, less land area required for automation, and noise abatement. The lifetime costs derived can be somewhat lower than those of conventional cars; therefore it is concluded that electric cars could be substituted advantageously for conventional cars for individual urban transportation. (Author)

AD-615 886 Div. 31/3
CFSTI Prices: HC$1.00 MF$0.50

Marine Physical Lab., Univ. of California, San Diego.
THE MOTION OF A SPAR BUOY IN SWELL. PART II.
Internal Memo.,
by Philip Rudnick. 7 Jul 60, 8p
Rept. no. MPL-U-21/60
Contract Nonr221605 Unclassified report

Descriptors: (*Spar buoys, Motion), Differential equation, Ocean waves, Pressure, Force(Mechanics), Torque.

Equations of motion are given below which take account of all the pressure forces with high accuracy, but completely neglect drag forces. The results of the previous simplified study of the vertical motion are confirmed; the principal new result is the amount of the horizontal force and its torque. (Author)

AD-615 896 Div. 26/1, 2/8, 14/6
CFSTI Prices: HC$2.00 MF$0.50

Brush Labs. Co., Cleveland, Ohio.
SYNTHETIC QUARTZ PILOT PLANT.
Final rept., step 1.
25 Oct 54, 26p Rept. no. Brush-534-13
Contract DA36 039SC30290 Unclassified report
Industrial Preparedness Study.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Quartz, Crystal growth), (*Crystal growth, Quartz), (*Crystals, Manufacturing methods), Processing, Industrial equipment, Heating elements, Potentiometers, Crystal holders, Crystal structure, Mechanical drawings, Production.

Synthetic quartz crystals were produced at the full capacity of a facility which had been erected and operated under a previous contract. The equipment consisted of six two-chamber rocking autoclaves, in which the crystals were grown by a hydrothermal method at elevated temperatures and pressures. Four of these autoclaves had a capacity of 100 liters and two had a capacity of 20 liters each. Necessary control and auxiliary equipment were also included. The total weight of the 5,515 crystals produced was 1,217 pounds. The weight of synthetic quartz deposited was 1,154 pounds, after subtracting for seed material.

AD-615 897 Div. 26/1, 2/8, 14/6
CFSTI Prices: HC$2.00 MF$0.50

Brush Labs. Co., Cleveland, Ohio.
SYNTHETIC QUARTZ.
Final rept., step 2.
25 Nov 54, 27p Rept. no. Brush -534-14
Contract DA36 039SC30290 Unclassified report
Industrial Preparedness Study General rept.

Descriptors: (*Quartz, Crystal growth), (*Crystal growth, Quartz), (*Crystals, Manufacturing methods), Production, Test equipment, Recrystallization, Industrial equipment, Costs, Specifications, Inventory, Management engineering, Manpower studies.

The study was accomplished concurrently with the procurement of a pilot run of 4390 Synthetic Quartz crystals, weighing 969.9 pounds. Quantities in pilot run were sufficient for determining mass production methods and required production and test equipment. Execution of Step II, Preparedness Measures resulted in an indicated lead time gain of 0 months to the initiation of production and 3 months to peak production as compared to 'no preparedness.'

AD-615 914 Div. 26/3, 26/4
CFSTI Prices: HC$4.00 MF$0.75

TRACOR, Inc., Austin, Tex.
PRODUCTION MODEL ACCEPTANCE CRITERIA.
Technical memo.,
by H. L. Gray. 24 May 65, 111p TRACOR-65-191-U
Contract NObsr93140, Proj. SS041 001, Task 8100
Unclassified report

Descriptors: (*Production control, Acceptability), Statistical processes, Probability, Tests, Analysis, Tables, Graphics.

The problem has been to determine how much useful statistical information could be obtained in regard to the MTBF (mean time between failures) of each individual production model on relatively short production model tests. It was realized from the start that if one is to be able to make confidence statements in regard to the MTBF at a significantly high level of confidence then it is necessary to combine the test times involved. Since once the test times are combined it is no problem to establish a confidence interval for the MTBF at a high level of confidence, the problem centered on determining a procedure for combining these times so that the resulting interval estimate of the MTBF could be construed as indicative of each production equipment. That is, the problem became one of determining a method of preventing poor equipment from being compensated for by good equipment when the test times were combined. Such a method has been presented in this report along with a complete analysis of the associated manufacturer's and consumer's risk. (Author)

AD-615 919 Div. 26/6
CFSTI Prices: HC$3.00 MF$0.75

Mechanical Technology, Inc., Latham, N.Y.
GAS BEARING DESIGN CHARTS. VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING.
Rept. for 1 May 64-31 Jan 65,
by H. S. Cheng, C. Y. Chow, and S. F. Murray. 1 Apr 65, 85p MTI-65TR5-II, vol. 1
Contract Nonr453500
Unclassified report

Descriptors: (*Journal bearing, Gas bearings), (*Thrust bearings, Gas bearings), (*Gas bearings, Design), Graphics, Performance(Engineering), Cylindrical bodies, Lubrication, Loading(Mechanics), Films, Hydrodynamics, Mathematical analysis, Dynamics, Statics.

Detailed procedures and design charts are given in this report for hydrodynamic gas journal bearings and gas-lubricated spiral grooved thrust bearings. Numerical examples are given to illustrate the use of these design charts. In addition, various factors governing the selection of the gas bearings are discussed. (Author)

AD-615 920 Div. 26/6
CFSTI Prices: HC$3.00 MF$0.75

Mechanical Technology, Inc., Latham, N. Y.
GAS BEARING DESIGN CHARTS. VOLUME 2. THE HYDROSTATIC GAS JOURNAL BEARING AND THE HYDROSTATIC GAS THRUST BEARING.
Rept. for 1 May 64-31 Jan 65,
by J. W. Lund. 1 Apr 65, 100p MTI-65TR5-II, Vol. 2
Contract Nonr453500
Unclassified report

Descriptors: (*Journal bearings, Gas bearings), (*Thrust bearings, Gas bearings), (*Gas bearings, Design), Graphics, Performance(Engineering), Lubrication, Loading(Mechanics), Hydrostatics, Mathematical analysis, Films, Dynamics.

This report gives the detailed procedures with accompanying graphs for the design and performance calcula-

tions of hydrostatic gas journal bearings and hydrostatic gas thrust bearings. The report emphasizes the application of the bearings to rotating machinery. A numerical example of such an application is given. (Author)

AD-615 945 Div. 13/4, 14/6, 25/6
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
A NOTE ON SANDWICH SHELL THEORY,
by T. C. Fan. 14 Apr 65, 20p
Rept. no. P-3121

Unclassified report

Descriptors: (*Sandwich construction, Structural properties), (*Structural shells, Structural properties), Theory, Deformation, Shear stresses, Differential equations, Strain(Mechanics), Stability.

The paper describes the probable development of classical theories employed in the stability analysis of sandwich shells. The validity of existing theories is scrutinized. New evidence collected in recent structural tests is used to propose some improvements in current sandwich shell theory. (Author)

AD-615 947 Div. 33/3, 32/4, 33/2
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
A POSSIBLE U.S. POLICY TOWARDS INDIAN TRANSPORTATION: AN ILLUSTRATION OF IMPROVED SECTORAL POLICIES,
by Alan Carlin. Jun 65, 78p
Rept. no. RM-4379-AID
Contract AF49 638 1293

Unclassified report

Descriptors: (*India, Transportation), (*Foreign aid, India), Foreign policy, Railroads, Roads, Shipping-(Marine), Economics, Government(Foreign), Commerce, Money, Costs, Mathematical models, Tables.

A discussion is presented of the merits of the sectoral approach as a supplement to present AID methods in assessing the amount and kind of assistance to be given to less-developed countries. It is concluded that more sectoral studies are needed, and shows how useful sectoral policies can be developed by applying existing economic theory to critical issues in the allocation of resources within a sector. The method is illustrated by a suggested U.S. policy towards Indian transportation. (Author)

AD-615 994 Div. 26/4, 26/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
WAYS FOR THE AUTOMATION OF NONDESTRUCTIVE WELD-JOINT INSPECTION METHODS,
by S. T. Nazarov. 14 May 65, 12p FTD-TT65-50
TT 65-62420

Unclassified report

Unedited rough draft trans. of mono. Vsesoyuznoe Obedinennoe Soveshchanie po Avtomatizatsii Proizvodstvennykh Protsessov v Mashinostroenii i Avtomatizirovannomu Elektroprivodu v Promyshlennosti (no. 3) Moscow, 1959. Trudy 1962 p227-32.

Descriptors: (*Welds, Non-destructive testing), (*Joints, Non-destructive testing), Automatic, Quality control, USSR, Test methods, Failure(Mechanics), Test equipment.

AD-615 996 Div. 13/4
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW,
by Erik T. Sohlberg. Apr 65, 36p
Technical rept. no. TR-152
Task IV025001A13001

Unclassified report

Descriptors: (*Strain gages, Foundations(Structures)), (*Foundations(Structures), Steel), (*Construction, Polar regions), Snow, Stresses, Strain(Mechanics), Loading(Mechanics), Welds, Cements, Moistureproofing, Selection, Installation, Captive tests, Cold weather tests, Anchors(Structural).

The report describes instrumentation for a preliminary test of friction piles in snow. Dynamic measurements of strain were made during driving by means of a dual oscilloscope fitted with a Land camera. The larger of the two H piles tested was an 8 x 8 WF 35 section and the smaller was a 6 x 6 M 20. Both were 30 ft long, driven in Sept. 1962, and left unloaded until the 1963 summer. A switch box was constructed and used during static tests, which allowed a forward, reverse, and calibration reading to be taken at each gage position in a minimum of time. Immediately after the load was applied, the upper section of the pile took most of the load. After the load was held in place for several weeks, each unit length of the pile had accepted an equal share of the total load. The 8 x 8 WF 35 pile was loaded to 40,000 lb and the 6 x 6 M 20 to 28,000 lb. Immediately after removal of the load, the upper section of the pile was relieved but most of the loaded strain remained in the bottom section. (Author)

AD-616 034 Div. 26/1, 13/4

Illinois Univ., Urbana. Dept. of Civil Engineering.
EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
Illinois cooperative highway research program series no. 35,
by W. W. Sanders, Jr., A. T. Derecho, and W. H. Munse. 1964, 8p Structural research series no. SRS-290
Proj. IHR64

Unclassified report

Pub. in Welding Journal Research Supplement p1-7 Feb 1965(Copies not available to DDC or Clearinghouse customers)
Report on Civil engineering studies.
Presented at the AWS Annual Meeting(45th) held in Detroit, Mich., May 4-8, 1964.

Descriptors: (*Welds, Fatigue(Mechanics)), (*Joints, Welds), Steel, Geometry.

Fatigue tests were conducted on simulated butt-welded specimens of ordinary structural grade steel with the simulated 'weld reinforcement' machined from base metal. The profile of the weld reinforcement was controlled by varying the radius at the toe of the weld and the flank angle between the base metal and the reinforcement. The specimens were tested under zero-to-tension and tension-to-compression stress cycles. Also included are studies of the geometry of transverse butt-welded fatigue specimens in high-strength quenched-and-tempered steels. Each specimen fracture was examined to determine the external geometrical factors which are critical in the determination of fatigue behavior. Examinations were also conducted on butt-welded joints of several grades of steel after testing under fatigue loadings. Measurements of the parameters characterizing the weld reinforcement geometry

at the point of fatigue fracture initiation, including the radius at the toe of the weld, R, the flank angle, the height, the width, and the area of the reinforcement, were made by means of plaster casts taken of the weld reinforcement prior to the testing of the specimens.

AD-616 035 Div. 13/4, 14/6

Illinois Univ., Urbana. Dept. of Civil Engineering.
FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
Illinois cooperative highway research program series no. 36,
by J. C. Walls, W. W. Sanders, Jr., and W. H. Munse.
14 Oct 63, 25p Structural research series no. SRS-291
Proj. IHR64

Unclassified report

Report on Civil engineering studies.
Pub. in Journal of the American Concrete Institute. Proceedings v62 n2 p169-92 Feb 1965(Copies not available to DDC or Clearinghouse customers)
Sponsored by Illinois Division of Highways and Bureau of Public Roads, U. S. Department of Commerce.

Descriptors: (*Beams(Structural), Fatigue(Mechanics)), (*Reinforcing materials, Fatigue(Mechanics)), (*Concrete, Reinforcing materials), Welding, Steel, Tests, Loading(Mechanics), Fracture(Mechanics), Joints, Stresses, Strain gages, Failure(Mechanics).

Fatigue tests were conducted on 23 reinforced concrete beams which contained single-V-butt-welded reinforcement. Most of the beams were reinforced with one no. 7 intermediate grade billet-steel reinforcing bar. Four beams, however, were reinforced with additional reinforcement to obtain an indication of the effect of variation in percentage of reinforcement and total bar perimeter. The majority of the tests were conducted with the load varying from zero to maximum, however, some of the tests of beams with one no. 7 reinforcing bar were conducted at a load range of one-half maximum to maximum. S-N diagrams for the beams were obtained and the results are compared with the results of tests on 60 deg singly-V-butt-welded bars tested axially. From a study of these results, methods for estimating the fatigue life of reinforced concrete beams with butt-welded reinforcement were obtained. (Author)

AD-616 111 Div. 26/4, 26/2
CFSTI Prices: HC$1.00 MF$0.50

Columbia Univ., New York. School of Engineering and Applied Science.
THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
Technical rept. no. 28, Jul-Sep 64,
by Leon S. White. 1 Jun 65, 21p
Contract Nonr26655, Proj. NR042 009

Unclassified report

Descriptors: (*Quality control, Industrial production), (*Industrial production, Quality control), (*Dynamic programming, Manufacturing methods), Operations research, Costs, Management planning.

A simple class of multistage inspection plans is considered for an ordered production process consisting of N- 1 manufacturing stages and a final inspection stage. The plans are applied to batches of items of size S. At each stage any number of items from O to S may be inspected. Defectives found are replaced with non-defectives. Costs of inspection, replacement, and the cost of undetected defectives are included. It is shown that under certain conditions an optimal inspection plan has the property that at every stage either the whole batch is inspected or no inspection is performed. In such cases a very simple dynamic program can be solved to find the optimal plan. (Author)

AD-616 119 Div. 13/1, 6/3
CFSTI Prices: HC$1.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR,
by George F. Linsteadt. Apr 65, 12p
NOTS-TP-3809
Task RMWC45 001 216 1F001 05 01

Unclassified report

Descriptors: (*Cooling, Infrared detectors), (*Refrigeration systems, Infrared detectors), (*Infrared detectors, Cooling), Vibration, Noise, Temperature control, Cryogenics, Design, Specifications, Performance(Engineering).

A technical evaluation of the Cryomite closed-cycle refrigerator was accomplished at the U. S. Naval Ordnance Test Station, China Lake. The device produced temperatures as low as 45K. However, direct mounting of an infrared detector on the Cryomite cold head produced microphonic problems which made the device unusable as a direct cooler. (Author)

AD-616 237 Div. 31/5
CFSTI Prices: HC$1.00 MF$0.50

New York Naval Shipyard, Brooklyn.
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY USS AUSTIN (LPD-4),
by M. Merend and J. W. Goodwin. 11 May 65, 8p
Vibration rept. no. 240-91

Unlassified report

Descriptors: (*Ship hulls, Vibration), (*Marine propulsion, Vibration), Turbines, Shafts, Reduction gears.

An underway vibration survey was conducted on the hull, main turbines, reduction gears, shafting and propellers during the Builders Trials 1-5 March 1965 and the Preliminary Acceptance Trials 27-29 April 1965. The results of the survey indicate a satisfactory condition with respect to vibration of the main propulsion machinery, shafting and propellers. (Author)

AD-616 241 Div. 26/3, 30/2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
AN INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM,
by L. S. Hill. 17 May 61, 12p Rept. no. P-2295

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. A copy is available for public sale.

Descriptors: (*Production control, Punched cards), (*Data processing systems, Production control), (*Management control systems, Data processing systems), Management planning, Digital computers, Manufacturing methods, Materials, Machine tools.

It is the purpose of the paper to present in abridged form a synthesized procedure for control of production using punched-card methods. The system may be con-

sidered a framework for application to any manufacturing enterprise engaged in the fabrication and assembly of parts, regardless of product. Machines are used to record and coordinate all paperwork involved in manufacturing from time of raw material receipt through transformation into finished product. A collateral objective of this presentation is to indicate that mechanization of the production control system is a logical role for the industrial engineer.

AD-616 273 Div. 26/1, 17/7
CFSTI Prices: HC$1.00 MF$0.50

Battersea Coll. of Tech., London (England).
USE OF REACTIVE ATMOSPHERES FOR THE TREATMENT OF B. C. C. METALS.
Quarterly engineering progress rept. no. 10, 1 Jan-31 Mar 65,
by I. J. Toth. 31 Mar 65, 3p
Contract N62558 3591
Unclassified report

Descriptors: (*Tungsten, Sintering), (*Sintering, Tests), Metallic crystals, Ductility, Nickel, Palladium, Chlorides, Great Britain, Crystal structure.

The sintering of tungsten compacts impregnated with solutions of palladium chloride or nickel chloride was studied. The results of bend tests indicated no ductility in the activation-sintered tungsten specimens. Post-sintering treatments for improving the ductility of palladium- and nickel-activation sintered specimens were found to be effective. The sintering kinetics of tungsten activated by nickel and palladium are being studied. The optimum concentration of the activator was found to be 0.130 wt.% of nickel and 0.317 wt.% of palladium. Additions of thoria, to stabilise the tungsten grain, have no effect on this. Rate exponents and activation energies for the sintering process were determined, and a model for theoretical purposes was devised. Test-pieces were prepared under standardised conditions (with optimum concentrations of activators) for studies of the de-embrittling treatments. (Extracted)

AD-616 281 Div. 26/1, 17/5
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SELECTION OF FLUX FOR WELDING HIGH-STRENGTH STEEL,
by K. V. Lyubavskii, B. N. Bad'yanov, and Z. D. Klestova. 13 May 65, 14p FTD-TT-65-49
TT 65-62437
Unclassified report

Unedited rough draft trans. of Svarochnoe Proizvodstvo (USSR) n10 p6-9 1964.

Descriptors: (*Welding, Steel), (*Fluxes(Fusion), Selection), USSR, Oxidation, Mechanical properties.

The effect of flux composition on the oxidation of the seam and its mechanical properties when welding 25-KHSNVFA steel was investigated. (Author)

AD-616 284 Div. 26/6, 27/3
CFSTI Prices: HC$3.00 MF$0.75

AeroJet-General Corp., Sacramento, Calif.
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
Quarterly progress rept. no. 3, 1 Jan 31-Mar 65.
7 Jun 65, 62p Rept. no. 7439-Q-3
Contract AF04 611 7439, Task 30205
AFRPL TR-65-97 Unclassified report

See also AD-610 493.

Descriptors: (*Journal bearings, Hydrostatics), (*Thrust bearings, Hydrostatics), (*Turbopumps, Bearings), (*Rocket motors(Liquid propellant), Turbopumps), Test equipment, Lubrication, Oils, Turbulence, Laminar flow, Design.

Initial acceptance testing of the electric drive, five journal bearing oil tests (laminar flow), and eight journal bearing water tests (turbulent flow) were conducted. Over three hundred data points at various shaft speeds and bearing loads were recorded, representing many hours of bearing operation. The condition of the bearings after testing and the correlation of test results with the applicable laminar theory and newly developed turbulent flow theory was excellent. The close correlation of the empirical and predicted data substantiates the validity of the turbulent flow theory to the point where only minor adjustments are needed to further improve the degree of correlation.

AD-616 286 Div. 31/3, 14/8
CFSTI Prices: HC$1.00 MF$0.50

Navy Underwater Sound Lab., New London, Conn.
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES.
Research rept.,
by Charles F. Gerber. 2 Apr 65, 25p
Rept. no. USL-644
Unclassified report

Descriptors: (*Floats, Buoyancy), (*Isocyanate plastics, Expanded plastics), (*Expanded plastics, Floats), Maintenance, Water.

The report describes experience gained from procedures involved in salvaging a floating dock by filling its deteriorated component pontoons with foamed-in-place polyurethane. In some cases, the plastic was placed on top of water running across the bottom of the pontoon. Polyurethane is usually foamed-in-place upon or in clean dry surfaces or volumes in order to develop the full strength, adhesion, sealing qualities, and closed-cell characteristics required to realize the maximum buoyant capability of the material. While the methods reported are not capable of providing 95 to 100 percent buoyancy maintenance, effective buoyancy retention greater than 80 percent may be expected under ordinary conditions at a cost appreciably less than half of that required for full buoyancy maintenance. Suggestions for more refined and efficient methods of utilizing the basic theories are included. (Author)

AD-616 313 Div. 13/4, 25/6, 2/3
CFSTI Prices: HC$1.00 MF$0.50

Army Cold Regions, Research and Engineering Lab., Hanover, N. H.
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION,
by Donald E. Nevel. Mar 65, 18p
Research rept. no. RR-136
Task 1V025001A13001
Unclassified report

Descriptors: (*Ice, Mechanics), (*Foundations (Structures), Ice), (*Polar regions, Foundations (Structures)), (*Floating bodies, Ice), Elasticity, Fracture(Mechanics), Loading(Mechanics), Depliction, Mathematical analysis, Army.

The solution of the problem of a semi-infinite plate

on an elastic foundation is presented. This problem occurs when a load is applied near the edge of a floating ice sheet. The equations are evaluated for an edge load, and the results given in graphical form for the following: (a) The maximum deflection which occurs at the edge under the load, (b) The moment which causes the initial cracking of the plate, (c) The distance from the edge that the circumferential crack will occur, (d) The moment that causes the circumferential crack. The same method of solution can be applied to an infinite strip on an elastic foundation with any combination of simple, rigid, or free support at the edges. (Author)

AD-616 314 Div. 13/2, 2/5
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions, Research and Engineering Lab., Hanover, N. H.
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61,
by J. E. McCoy. Feb 65, 33p Technical rept. no. TR-120
Task 5010 02209 Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Permafrost, Charges(Explosives)), (*Earth-handling equipment, Alaska), (*Alaska, Earth-handling equipment), Explosive materials, Compressed air, Drills, Spheres, Cylindrical bodies, Cratering, Detonations, Cold weather tests.

Spherical and cylindrical charges of 1, 4, 8, 32, 256 and 2560 lb were exploded in frozen silt near Fairbanks, Alaska, to investigate the applicability of lambda scaling for placing charges in frozen ground. One hundred and thirty holes, ranging from 3 to 6 in. in diameter, and 2 to 6 ft in depth, were drilled with a truck-mounted core drill. Compressed air, passed through an air-to-air heat exchanger to cool it below 25F, was used as a drilling fluid. Charge emplacement, stemming, and detonation are also described. Six basic series were fired which, except for the 2560-lb shots, consisted of two spheres and two cylinders buried at each of six scale depths. The crater volume was calculated by the centroid-volume method. A planimeter was used to measure the area of two mutually perpendicular cross sections through the center of the blast hole. Upon detonation of charges of a given weight at increasing depths, the resultant crater will increase to a maximum and rapidly drop off and disappear. At depths slightly beyond optimum, lambda scaling does not apply and the results are indeterminate. (Author)

AD-616 423 Div. 26/2, 1/2

RAND Corp., Santa Monica, Calif.
ON THE FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES,
by R. A. Davis and R. Schamberg. 14 Dec 59, 12p
Rept. no. P-1865
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Management engineering, Aerospace craft), (*Aircraft industry, Operations research), (*Operations research, Aircraft industry), Design, Budgets, Industrial production, Spacecraft, Guided missiles.

The ever expanding scope of Operations Research Activity in the Aircraft, Missile and Spaceflight fields is traced, beginning with the search for optimal employment of existing military aircraft in World War II. The most promising area for future application of operations research is believed to be the search for preferred operational concepts in an era when an advanced technology renders feasible a greater variety of expensive systems than can generally be developed and procured with available budgets. From a point of view, approximating that of a military customer, it is indicated that the effectiveness of operations analysis performed by the aircraft and missile industry can be improved considerably through early collaboration between advanced design and operations research groups, with the aim of creating a preferred, balanced system rather than devising optimal tactics for the employment of a specific vehicle configuration. The paper concludes with a discussion of several problem areas which deserve concentrated operations research effort by the space industry. These problem areas arise primarily from the following characteristics of many space systems: desired long system life, desired high system reliability, relatively small number of vehicles required. (Author)

14. Methods and Equipment

AD-615 769 Div. 30/5, 13/4, 14/6
CFSTI Prices: HC$3.00 MF$0.75

Naval Civil Engineering Lab., Port Hueneme, Calif.
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
Progress rept. for Jan 63-Jun 64,
by Ronald E. Jones. May 65, 92p
Technical rept. no. R-369
Proj. Y F015 01 01 001c
Unclassified report

Descriptors: (*Underwater equipment, Materials), (*Materials, Environmental tests), (*Sea water, Materials), Instrumentation, Test equipment, Underwater objects, Test facilities, Design.

Four submersible test units (STU's) were emplaced, exposing specimens of various materials to the sea floor sediment and to the surrounding water for various time periods and at various depths. Emplacement of the four and the retrieval of one (after 4 months) are reported in detail, and the rigging and instrumentation systems are described. The heaviest STU emplaced so far weighed almost 7,500 pounds and supported about 2,400 specimens of 600 different materials. Emplacements were made at depths of 2,400, 5,600, and 6,700 feet. Operations and system performance are discussed and conclusions and recommendations are presented. (Author)

AD-615 788 Div. 30/4, 2/9
CFSTI Prices: HC$1.00 MF$0.50

Pacific Marine Station, Dillon Beach, Calif.
THE PACIFIC MARINE STATION SEA WATER SYSTEM.
Design rept.,
by Joel W. Hedgpeth and R. J. Oliver. 15 May 65, 14p
Contract Nonr300202, Proj. NR104 626
Unclassified report

Descriptors: (*Sea water, Marine biological laboratories), (*Marine biological laboratories, Sea water), Pacific Ocean, Seacoast, Beaches, Water tanks, Design, Pipes, Pumps, Filters(Fluid), Laboratory equipment, Water supplies, Salinity, Operation, Costs, Budgets.

This report is a description of the design, construction and operation of a sea water system drawing sea water from a sand beach by stainless steel well point and pumping same to Pacific Marine Station. The total distance from intake to storage tank is approximately 1,000 feet; the lift is about 40 ft. UPVC pipe is used throughout. Initial cost of the system was $6,102.63. (Author)

AD-615 792 Div. 30/4, 12/2, 12/3
CFSTI Prices: HC$2.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
USER'S GUIDE TO THE EXPERIMENTAL SURFACE-LAUNCHED WEAPON-CONTROL TEST FACILITY.
Jun 65, 35p NOTS-TP-3565, Rev. 1
Unclassified report

Descriptors: (*Test facilities, Guided missiles), (*Guided missiles, Control systems), (*Guided missile ranges, Naval shore establishments), Guided missiles-(Surface-to-air), Guided missiles(Surface-to-surface), Fire control systems, Fire control computers, Guided missile launchers, Radar tracking, Digital computers, Simulators, Weapon systems, Fire control system components, Test equipment, Optical tracking, Radar equipment.

The U. S. Naval Ordnance Test Station (NOTS), China Lake, California has established a special in-house equipment test facility on the G-1 Guided Missile Range. The facility, designed for experimental test and pre-prototype evaluation of new concepts and equipments relating to shipboard fire control (both digital and analog), is available for use by activities operating under Navy auspices. This handbook describes the equipment and instrumentation available at G-1 Range as they pertain to surface launched weapon control exploratory development. (Author)

AD-615 793 Div. 30/4, 20/2
CFSTI Prices: HC$7.00 MF$2.00

Nevada Bureau of Mines, Reno. Desert Research Inst.
GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS OF THE SAND SPRINGS RANGE, FAIRVIEW VALLEY, AND FOURMILE FLAT, CHURCHILL COUNTY, NEVADA.
Final rept.
1964, 395p
Proj. 33 2
ARPA VUF-1001
Unclassified report

Rept. on VELA UNIFORM Proj. SHOAL, Fallon, Nev., 26 Oct 63.
Rept. prepared in cooperation with Univ. of Nevada, Reno.

Descriptors: (*Nuclear explosions, Site selection), (*Test facilities, Nuclear explosions), Geology, Structural geology, Geophysics, Chemistry, Hydrology, Underground explosions, Nevada.

AD-615 802 Div. 30/3, 25/6
CFSTI Prices: HC$1.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
NOTES ON THE USE OF SEMICONDUCTOR STRAIN GAGES,
by Harry J. Davis and Leon Horn. 30 Apr 65,
15p Rept. no. TR-1285
Prcjs. 1P010501A008, 30300
Unclassified report

Descriptors: (*Strain gages, Semiconductors), (*Semiconductors, Strain gages), Semiconductors devices, Resistance(Electrical), Impurities, Temperature, Voltage, Sensitivity, Operation.

The properties, advantages, and limitations of semiconducting strain gages as measurement tools are reviewed from the user's point of view. Conventional and semiconductor gages are compared. Compensation techniques for nonlinearity and for temperature effects are described. (Author)

AD-615 831 Div. 30/5, 30/2

Mitre Corp., Bedford, Mass.
DIGITAL SIMULATION AND MODELLING,
by G. B. Hawthorne, Jr. 1964, 6p
Contract AF19 628 2390
ESD tdr-64-106
Unclassified report

Pub. in Datamation Magazine Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Simulation, Digital computers), (*Models-(Simulations), Digital computers), Mathematical models,

Systems engineering, Performance(Engineering), Monte Carlo method.

AD-615 866 Div. 30/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
MAGNETOSTATIC PRISM FOR ADJUSTING OF ELECTRON MICROSCOPE,
by P. A. Stoyanov. 5 May 65, 5p FTD-TT-64-1380
TT 65-62390

Unclassified report

Unedited rough draft trans. of Russian Patent 160780, appl. 820653/26-10, 19 Feb 63.

Descriptors: (*Electron microscopes, Prisms), (*Prisms, Electron microscopes), Magnets, Magnetic fields, Optics Cylindrical bodies, Patents, USSR.

A magnetostatic prism is proposed for adjusting an electron microscope. It contains a revolving permanent magnet, creating a magnetic field, perpendicular to the optical axis of the microscope, and is distinguished by simplicity of design. It is provided with a screen moving along the axis, the screen being designed in the form of a cylinder, the geometrical axis of which is superimposed on the optical axis of the microscope, while the shifting of the screen and the turning of the magnet is accomplished by one general drive, or by two independent ones. (Author)

AD-615 912 Div. 30/3, 2/4, 25/4
CFSTI Prices: HC$4.00 MF$0.75

Barkley and Dexter Labs., Inc., Fitchburg, Mass.
RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS.
Final rept. for Nov 63-Jan 65,
by Raymond B. Wilson, Jr. Jan 65, 104p
Contract AF19 628 3895, Proj. 7600, Task 760006
AFCRL 65-196

Unclassified report

Descriptors: (*Lasers, Geodesics), (*Geodesics, Lasers), Design, Photomultipliers, Ruby, Telescopes, Measurement, Timing devices, Camera shutters, Circuits, Solar cells, Cooling, Tests.

The two areas reported on in laser work are a feasibility study of a gas laser in geodetic leveling, which terminates in suggestions for a gas laser oriented leveling system, and a medium power Q-switched laser capable of ranging experiments. The Q-switched laser was constructed under the contract. Shutter and photomultiplier tube studies were conducted. A portable laser power supply, timing system for a PC 1000 external shutter, and 5 channel current amplifier were constructed, and a description of each is given. (Author)

AD-615 951 Div. 30/5, 14/7
CFSTI Prices: HC$1.00 MF$0.50

Naval Civil Engineering Lab., Port Hueneme, Calif.
EXPERIMENTS IN THE IDENTIFICATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
Interim rept. for 10 Jan-15 May 63,
by R. J. McGowan. 3 May 65, 7p
Technical note N-521
Proj. Y R007 08 03 302

Unclassified report

Descriptors: (*Paints, Identification), (*Test methods, Reflection), (*Spectroscopy, Paints), Attenuation, Pigments, Spectra(Infrared), Infrared spectroscopy.

In order to obtain a spectrum of the nonvolatile vehicle of paint samples with infrared transmission spectrophotometry, the pigment must be separated from the vehicle. This separation is time consuming and costly; therefore, an investigation of the use of attenuated total reflectance was conducted to determine if it would eliminate the need to separate the pigment from the vehicle in order to obtain a qualitatively useful spectrum. This technique was shown to be effective in producing an infrared spectrum qualitatively similar in certain regions of the spectrum to that obtained by the conventional methods. (Author)

AD-615 992 Div. 30/3, 26/4
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
AUTOMATIC GAMMA FLAW DETECTOR,
by A. V. Dzhabadari and Ya. R. Khvedelyani. 7 May 65, 6p FTD-TT-64-1381
TT 65-62418

Unclassified report

Unedited rough draft trans. of Russian patent 153139, appl. 737340/25, 6 Jul 61, 3p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Gamma rays, Non-destructive testing), (*Test equipment, Quality control), (*Non-destructive testing, Gamma rays), Patents, Automatic, Containers, Radioactivity, Monitors, USSR.

The invention is an automatic gamma flaw detector with a protecting container, holding radioactive preparations of varying intensities. The ampoules are fastened on the ends of flexible lines and wound onto drums mechanically connected to an electric motor which is controlled by turning the drums. A throw-over adaptation device serves for shifting a roller axially over the drum in order to link the shaft of the motor with the respective drums.

AD-615 997 Div. 30/3, 13/4
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW,
by Landon Niedringhaus. Apr 65, 28p
Technical rept. no. TR-153
Task IV025001A13001

Unclassified report

Descriptors: (*Snow, Hardness), (*Test equipment, Snow), (*Construction, Polar regions), Greenland, Cold weather tests, Hammers, Penetration, Theory, Design, Tables, Hardness.

Studies were performed at Houghton, Mich. and Camp Century, Greenland, during 1963 to investigate various modifications of the Rammsonde and to improve its suitability for use in hard snow. The report includes theoretical considerations, a description of the study, and the design and use of the instrument. The Rammsonde presently used by USA CRREL was found to be unsatisfactory for use in processed, age-hardened snow of extreme hardness. It was discovered that the hammer-drop height had little effect on the hardness values obtained, but the hammer weight and the time interval between blows had a noticeable effect on the results and must be taken into consideration when performing ram-hardness tests. (Author)

AD-616 021 Div. 30/3, 8/2, 20/3

Defence Research Telecommunications Establishment, Ottawa (Ontario).
A SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS,
by A. L. Barry and J. A. Bingham. 17 Nov 64, 2p
Unclassified report

Pub. in Proceedings of the IEEE v53 n2 p211 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Radiation damage, Transistors), (*Ionization gages, Radiation damage), Ionization, Encapsulation, Measurement.

A ionization gage is described for measuring the rate of ionization produced by radiation within the transistor encapsulation.

AD-616 075 Div. 30/3, 8/2

California Univ., Santa Barbara.
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHz,
by F. C. Fehsenfeld, K. M. Evenson, and H. P. Broida. 27 Mar 64, 5p Technical rept. no. TR-9
Contract Nonr422201, ARPA Order 125
Unclassified report

Pub. in Review of Scientific Instruments v36 n3 p294-8 Mar 1965 (Copies not available to DDC or Clearinghouse customers).
Manuscript submitted in final form 9 Nov 64.

Descriptors: (*Electrical discharges, Instrumentation), (*Microwave equipment, Electrical discharges), Gases, Hydrogen, Helium, Gas discharges.

Five simple microwave cavities for producing discharges in gases were tested in He and H2 at pressures from 1 micron to 1 atm. Three of the cavities are commonly used, and two have been recently designed. One of the newly designed cavities offered a considerable improvement over early models with respect to compactness, ease of attachment to the system, and efficiency. (Author)

AD-616 133 Div. 30/3, 13/1

Lincoln Lab., Mass. Inst. of Tech., Lexington.
ELECTRIC FURNACE FOR OPERATION IN OXIDIZING, NEUTRAL, AND REDUCING ATMOSPHERES TO 2400 C,
by T. B. Reed and R. E. Fahey. 18 Sep 64, 2p
Rept. no. JA-2443
Contract AF19 628 500
Unclassified report

Pub. in The Review of Scientific Instruments v36 n3 p289-90 Mar 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Furnaces, Resistance(Electrical)), Oxidation, Reduction(Chemistry), Vacuum furnaces, Tantalum, Argon, Heat shields.

A simple resistance-heated furnace has been developed for operation at temperatures up to 2400 C in oxidizing as well as neutral or reducing atmospheres. The sample to be heated is placed in a dense zirconia tube, which is mounted inside a vertical split-tube tantalum heating element. Any desired atmosphere may be used inside the zirconia tube without damaging the heating element, which is operated in argon. The heating element, which is also protected by the zirconia tube from attack by vapors from the sample, is surrounded by tantalum heat shields in a water-cooled outer shell. A temperature of 2400 C was reached in a 2.22-cm-i.d. zirconia tube at a power level of 8 kW, and 2200 C was reached in a 3.5-cm tube using 6.5 kW. (Author)

AD-616 145 Div. 30/3, 4/4, 8/2, 2/7

Lockheed Missiles and Space Co., Palo Alto, Calif.
BAKEABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE,
by T. M. Shaw, G. H. Brooks, and R. C. Gunton.
7 Dec 64, 3p
Unclassified report

Pub. in Review of Scientific Instruments v36 n4 p478-80 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cavity resonators, Design), (*Plasma medium, Test equipment), (*Nitrogen compounds, Gas ionization), (*Gas ionization, Measurement), Oxides, Electrons, Microwave equipment, Waveguide couplers, X band, Lithium compounds, Fluorides, Ultraviolet radiation, Photochemistry.

This paper describes the design and construction of an X-band cavity resonator equipped with a variable microwave coupling device for use in the study of electron loss processes in nitric oxide plasmas. A lithium fluoride window is provided to permit plasma production by ultraviolet irradiation down to 1100 A. The cavity is suitable for use with ultrahigh vacuum systems and can be outgassed by baking at temperatures up to 350C. (Author)

AD-616 151 Div. 30/3, 8/3

Naval Ordnance Test Station, China Lake, Calif.
OPTIMUM RC FILTERING AND INTEGRATION FOR SEQUENTIAL MEASUREMENT OF dc SIGNALS,
by J. O. Porteus. 1 Jun 64, 9p NOTS-TP-3795
Task R360FR106 216 1R011 01 01
NAVWEPS 8736
Unclassified report

Pub. in Review of Scientific Instruments v35 n12 p1673-8 Dec 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Direct current, Measurement), Integrators, Electric filters, Capacitance, Resistance(Electrical), Optimization, Transients, Errors, Statistical analysis.

An optimization study of conventional RC filters and integrators used in measuring dc signals in the presence of noise and ripple is presented. Mathematical expressions for the variance of measurements made with such systems, used separately and in combination, are derived under the assumption that the signal remains constant over a sampling interval of given duration. Optimum filter time constants and delay times for integration are then obtained from these expressions for practical application. A comparative analysis of optimized systems leads to the conclusion that in many cases the performance of an optimized RC filter is superior to that of an integrator used without filtering. However, an optimum combination of filtering and integration may lead to a substantial gain in precision over that possible in a given time interval, using either an integrator or an RC filter alone. (Author)

AD-616 208 Div. 30/3

Illinois Univ., Urbana.
HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE,
by R. L. Odle and C. P. Flynn. 6 Jul 64, 2p
Grant AF AFOSR192 62, Proj. 9763, Task 9763 01
AFOSR 65-0798

Unclassified report

Pub. in The Review of Scientific Instruments v35 n11 p1611-2 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Probes(Electromagnetic), Nuclear magnetic resonance), High-temperature research, Radiofrequency, Shielding.

An r-f probe was developed which is simple, rugged, and capable of operating at a considerably high temperature, i.e., 1300C. The probe assembly consists of 2 basic parts: (1) a ceramic coil former, which contains the sample chamber and (2) a stainless steel shield enclosing the coil former. A thermocouple passes through a hole in the shield and into the coil former, thereby allowing the specimen temperature to be monitored during an experiment. (Author)

AD-616 328 Div. 30/3
CFSTI Prices: HC$2.00 MF$0.50

Transducer Information Center, Battelle Memorial Inst., Columbus, Ohio.
QUARTERLY ACCESSION LIST 8.
15 Apr 65, 32p TIC-Acc-list-8
Contract AF33 615 1819, Proj. 8222, Task 822203

Unclassified report

See also AD-611 554.

Descriptors: (*Test equipment, Abstracting), (*Instrumentation, Abstracting), Accelerometers, Acoustic equipment, Hydrophones, Attitude indicators, Flowmeters, Gyroscopes, Pressure gages, Anemometers, Tensiometers, Tachometers, Transducers, Monitors, Magnetometers, Poteniometers, Seismographs, Polymers, Cryogenics, Humidity, Temperature senstive elements, Transducers.

Contents:
Acceleration
Acoustic
Attitude
Displacement
Flow
Force
Gyro
Humidity
Level
Magnetic field
Position
Pressure
Rotary speed (rpm)
Strain
Temperature
Vibration

AD-616 339 Div. 32/4
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
COST-EFFECTIVENESS: AN INTRODUCTION AND OVERVIEW,
by E. S. Quade. May 65, 20p Rept. no. P-3134

Unclassified report

Descriptors: (*Costs, Effectiveness), (*Decision making, Costs), Mathematical models, Theory, Symposia.

The paper discusses the scope of cost-effectiveness analysis, along with its problems and limitations.

AD-616 340 Div. 30/5, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Engineering Mechanics Research Lab., Univ. of Texas, Austin.
A NEW METHOD FOR THE PREPARATION OF SUCCESSIVE REPLICAS FOR USE IN ELECTRON MICROSCOPY,
by M. A. Wilkov. Jan 65, 15p EMRL-RM-1002
Grant AF AFOSR560 64
AFOSR 65-1071

Unclassified report

Descriptors: (*Electron microscopy, Microphotography), Deformation, Loading(Mechanics), Aluminum, Single crystals, Steel, Surface properties, Fatigue(Mechanics), Stresses, Microscopes, Micrometers, Optical instruments, Metallography.

A new method is described for making negative carbon platinum replicas of a selected area. Location of the area to be replicated is accomplished with a micrometer mechanical stage on an optical microscope. A collodion matrix is then formed on a replica grid and the entire assembly is dry stripped with tape. This process does not disturb the specimen surface, even after many replications, which enables the method to be used in the study of the changes in surface structure during mechanical deformation. Several examples of the process are given by the micrographs of the surface damage of aluminum single crystals and 4340 steel specimens subjected to a fatigue stress. (Author)

AD-616 415 Div. 30/3
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
OPTIMUM SEARCH ROUTINES FOR AUTOMATIC FAULT LOCATION,
by Sidney I. Firstman and Brian Gluss. 11 Dec 59
20p Rept. no. P-1857

Unclassified report

Prepared in cooperation with Illinois Inst. of Tech., Chicago.

Descriptors: (*Search theory, Realibility), Military requirements, Test equipment, Economics, Operations research, Probability.

15. Military Sciences

AD-615 779 Div. 18/1, 20/2
CFSTI Prices: HC$3.00 MF$0.75

Institute for Defense Analyses, Arlington, Va.
Economic and Political Studies Div.
A DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY,
by Grace J. Kelleher. Apr 65, 74p
Study S-186, IDA-HQ-65-3518
Contract OCD OS63 134, Task 4113C
Unclassified report

Descriptors: (*Shelters, Nuclear explosion damage), (*Nuclear explosion damage, Shelters), (*Civil defense systems, Shelters), Radioactive fallout, Survival, Nuclear warfare casualties, National defense, Urban areas, Population, Blast, Costs, Mathematical models.

A damage-limiting strategy for allocating blast and fallout shelter protection is proposed. The features which combine to make this strategy unique are its relatively fine-grained local orientation and its ability to meet a survival percentage criterion irrespective of the actual ground zero within the area considered. The strategy proposed here tailors shelter postures to the conditions and needs of individual cities or local areas. This local approach could be used to develop a national shelter program evaluating the needs of many cities by serial application of the shelter allocation model. Shelter postures produced under this strategy consider all potential ground zeros within the protected area as part of the shelter allocation process; thus, fatalities from immediate blast effects and fallout are limited to a stipulated level, irrespective of where an assumed weapon might be delivered within a target city. Costs are minimized in the shelter allocation process by following three specific decision rules described.

AD-615 828 Div. 18/3, 26/2, 26/3
CFSTI Prices: HC$3.00 MF$0.75

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson AFB, Ohio.
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES,
by Victor J. Presutti, Jr. and Irving Katz. May 65, 62p Operations analysis rept. no. 5
Unclassified report

Descriptors: (*Logistics, Inventory control), (*Inventory control, Logistics), (*Stock level control, Logistics), Air Force Logistics Command, Management control systems, Air force procurement, Costs, Computers, Simulation, Mathematical analysis, Probability, Tables, Operations research.

The study was designed to improve logistic rationing procedures. In the process of making the changes several special purpose estimates of the demand rate were used, a departure from typical multi-purpose applications of a single estimate. A computer simulation of the new procedures is described. It reveals that the changes simultaneously reduce costs and increase support effectiveness. Initial efforts to improve safety levels are also discussed. These are made a function of the unit cost for each line item, in an effort to obtain the most protection per dollar invested, across the entire inventory of almost a million line items.

AD-615 892 Div. 18/3, 26/3, 27/1
CFSTI Prices: HC$2.00 MF$0.50

Frankford Arsenal, Philadelphia, Pa.
MULTI-LEVEL INVENTORY SYSTEMS: THE CASE OF THE SPARE AIRCRAFT ENGINES,
by D. Hoekstra. 1964, 26p
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
Paper presented at the October 1964 Joint TIMS-ORSA Meeting Minneapolis, Minnesota.

Descriptors: (*Inventory control, Optimization), (*Industrial procurement, Optimization), (*Aircraft engines, Spare parts), Stock level control, Army procurement, Logistics, Inventory analysis, Operations research, Scheduling, Probability, Distribution.

Military supply systems usually exhibit a multi-level structure, i.e., stockage points at the top of the pyramid (depots) do not directly serve equipment users but their customers are themselves stockage points. The objective used in 'optimizing' depot level inventory control procedures is usually of the form: minimize the total cost of providing a specified level of service to the depot customers. The problem lies in specifying the level of service, expressed in terms of statistics such as the fraction of time in stock or the average customer waiting time that should be given to the next lower level. What is the effect, for instance, on the ultimate user and the total system cost if depots maintain a higher level of inventory, thereby providing better service to their customers. Little work has been done on the distribution of a given total inventory over different levels of stockage points in the general case. However, some specific systems, because of their special structure, lend themselves more readily to analysis. This paper presents the computational results obtained for a bi-level circular supply system for aircraft engine spares. It is shown that the overall system's performance is very sensitive to the distribution of inventory over the two levels and that maximal system performance is obtained with a surprisingly small amount of inventory at the higher level. (Author)

AD-615 911 Div. 18/1, 20/6
CFSTI Prices: HC$4.00 MF$1.00

Gautney and Jones, Washington, D. C.
RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER. Final rept.,
by Melvin E. Lawson, Jr. and Marvin C. Baker, Jr.
Mar 65, 126p Rept. no. 64-12-65
Contract OCD PS64 12, Task 2111E
Unclassified report

Descriptors: (*Radiation monitors, Civil defense systems), (*Civil defense systems, Radiation monitors), Radiation measurement systems, Radiological contamination, Radiological dosage, Radioactive fallout, Radioactivity, Radiation hazards, Display systems, Civil defense personnel, Nuclear warfare, Data transmission systems, Handling, Population, Costs, Automatic, Maps, Graphics, Tables.

The report concerns a radiological data gathering and handling system developed for use in local level Civil Defense Emergency Operating Centers. The system provides for rapid development of a comprehensive radiation level picture throughout the EOC area of responsibility, with minimum exposure of monitoring personnel and with minimum demands on communications facilities. A 'backbone' system of remote automatic monitoring instruments is described. Provisions for visual display of radiological defense intelligency, utilizing a remote controlled, electro-mechanical display board, are included. Recommended procedures, forms, staff requirements, and a test exercise of the

system are contained in the report. In designing the forms and visual display devices so that they may be prepared locally, and in making maximum use of existing facilities and personnel, the cost of instituting such a system has been minimized. (Author)

AD-615 913 Div. 18/3, 12/5, 31/4
CFSTI Prices: HC$2.00 MF$0.50

Litton Systems, Inc., Washington, D. C. Applied Science Div.
ON FBM SPARE PARTS USAGE RATE DEVELOPMENT,
by William D. Commins, Jr. 12 May 65, 27p
Contracts Nonr481400, Nonr424500, Proj. 345 109
Unclassified report

Descriptors: (*Guided missiles(Underwater-to-surface), Spare parts), (*Spare parts, Inventory analysis), (*Submarines, Guided missiles(Underwater-to-surface)), Statistical processes, Submarines, Probability, Mathematical analysis, Logistics.

The problem of spare parts usage rate development for planning, provisioning, budgeting and allowance list preparation is treated for the FBM (fleet ballistic missile) logistics system. After a discussion of some data characteristics and rate possibilities, specific rate development algorithms are presented. (Author)

AD-615 948 Div. 18/3, 30/2
CFSTI Prices: HC$3.00 MF$0.50

RAND Corp., Santa Monica, Calif.
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT,
by Edward F. R. Hearle and Raymond J. Mason.
Apr 65, 52p Rept. no. RM-4220-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Data processing systems, Inventory control), (*Inventory control, Data processing systems), (*Weapon systems, Inventory control), Air Force procurement, Distribution, Computers, Oklahoma.

This Memorandum examines a pioneering Air Force effort to apply the electronic computer to inventory management -- the stock control and distribution system developed and operated by the Oklahoma City Air Materiel Area (OCAMA). OCAMA modified and refined the original RAND concept and applied it to several weapons systems, principally the B-52 and KC-135. The major changes in concept narrowed the system functions to stock control and distribution and eliminated the maintenance of base balances, leaving these entirely with base level systems. Since its beginning in 1955, the system has developed through four basic and four auxiliary phases, and has employed six different configurations of data-processing equipment. OCAMA's successful experience suggests the principle that new complex data systems should be developed from concepts having specific focus and providing implementation in discrete phases, each of which constitutes in itself an operating system.

AD-616 365 Div. 18/7, 32/8
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
A SCIENTIST'S NOTES ON THE COLD WAR,
by A. G. Wilson. 18 Sep 59, 21p
Rept. no. P-1801
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Cold war, Theory), Propaganda, Foreign policy, Government(Foreign), Communists, Culture, Attitudes.

Personal impressions of the cold war are discussed by an American scientist who travelled around the world last year attending scientific conferences, including the Tenth General Assembly of the International Astronomical Union at Moscow. The non-technical side lights on the cold war struggle which are reported here point out the ubiquity of the present conflict.

AD-616 367 Div. 18/1, 32/4

RAND Corp., Santa Monica, Calif.
THE FEDERAL BUDGET AS AN INDICATOR OF GOVERNMENT INTENTIONS AND THE IMPLICATIONS OF INTENTIONS,
by David Novick. 1 Oct 59, 25p Rept. no. P-1803
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
Prepared for presentation at American Statistical Association Meeting, Washington, D. C., December 1959.

Descriptors: (*United States Government, Management planning), (*Federal budgets, National defense), United States Government, Foreign policy, Defense systems, Weapon systems, Economics, Government procurement, Decision making.

The purpose of this paper is to consider briefly the extent to which the budget can be visualized as an indicator of government intentions and, perhaps more importantly, as an indicator of the implications of these intentions. This is done with respect to both the current budget structure and possible alternative structures. Particularly in conjunction with the latter, illustrative examples are used at various points in the discussion. For the most part, these are drawn from a national security context. The reasons for this are: (1) The defense area currently accounts for well over half the total federal budget and has by far a greater impact on the economy than any other single sphere of governmental activity; (2) The decision-making and administrative problems are probably as difficult--perhaps more so--in this area as in any other; and (3) The author's experience in recent years has stemmed primarily from dealing with defense problems. (Author)

AD-616 378 Div. 18/3, 26/2, 30/5, 12/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING,
by Murray A. Geisler. 20 Oct 59, 18p
Rept. no. P-1823
Unclassified report

Prepared for presentation at the Decennial Logistics Conference under the joint sponsorship of The George Washington Univ. and the Office of Naval Research, in Wash., D. C., Jan 60.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Weapon systems, Management planning), (*Logistics, Weapon systems), (*Systems engineering, Logistics), Operations research, Guided missiles, Ground support equipment, Simulation, Management engineering.

Support planning under present conditions of rapid exploitation of technological advances to maintain the most advanced weapon inventory creates many new stresses for planning the support of these new weapons. In addition, support planning has always been incomplete in that there has not been a systematic way of adjusting plans to reflect operational experience. The second major experiment of the RAND Logistics Systems Laboratory has produced techniques of support planning for new weapons which may represent major advances in such activities. This paper describes the conditions under which support planning must by performed in the present and future military environment and the experience of LP-II in performing such planning for an ICBM weapon of the 1963-65 time period, as an example. (Author)

AD-616 380 Div. 18/3, 33/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION,
by W. A. Niskanen and R. B. Rainey. 23 Oct 59, 15p Rept. no. P-1826 Unclassified report

Prepared for presentation at meeting of Operations Research Society of America. Pasadena, Calif., 11 Nov 59.

Descriptors: (*Armed forces transportation, Aircraft), (*Air transportation, Military requirements), Operations research, Armed forces operations, Commercial planes, Costs, Transport planes, Programming(Computers), Logistics.

During the next critical decade, what will be the nature and magnitude of the major military airlift missions. In a period of rapid technological change and greatly augmented commercial airlift resources, what will be the best combination of aircraft and trained personnel to perform these missions. These issues must be resolved within the next few years, regardless of the outcome of the current controversy, in order to build an effective military air transport system for the next decade. This paper discusses the use of various operations research techniques to help resolve these issues.

AD-616 413 Div. 18/7, 18/4
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOME MILITARY APPLICATIONS OF THE THEORY OF GAMES,
by Melvin Dresher. 10 Dec 59, 16p
Rept. no. P-1849 Unclassified report
Prepared for presentation at the SHAPE Operations Research/Scientific Advisory Conference (5th), 18-20 May 60.

Descriptors: (*Game theory, Armed forces operations), (*Armed forces operations, Game theory), Operations research.

Many military problems are concerned with the allocation of forces in space and/or time in a competitive environment. We shall give some examples of the application of the theory of games to such problems. The examples are from three general military fields: strategic air war, tactical air war, and target prediction. An important problem in strategic air war is the target selection problem - the choice of targets for attack and defense. This problem is formulated both as a finite game and an infinite game. In each case the optimal allocations are described. In the tactical air war example we view the tactical air war game as consisting of a series of strikes, or moves, each of which consists of simultaneous counter-air, air defense, and close support operations by each side to accomplish a given theater mission. We give some general properties of the optimal allocations. Finally, the problem of scheduling the launching of missiles is described as an example of target prediction. The optimal launching schedules are described for both sides. (Author)

AD-616 426 Div. 18/3, 26/2

RAND Corp., Santa Monica, Calif.
LOGISTICS RESEARCH AND MANAGEMENT SCIENCE,
by Murray A. Geisler. 29 Dec 59, 20p
Rept. no. P-1868 Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Logistics, Air Force), (*Management engineering, Air Force), Air force research, Weapon systems, Military operations, Management control systems, Military facilities, Military organizations.

The United States Air Force provides a tremendously complex and challenging setting for management science. Many useful contributions have been made to the management of the logistics system through the application of research techniques. However, in many ways the surface has been barely scratched. One lesson, above all, persists from this experience -- the effort must be consistent and undeterred. It is very difficult to change an organization as large as the Air Force very rapidly, and it is even more important that the changes be in the right direction. Caution on the part of the scientist and the customer is therefore a desirable strategy. At the same time, the demands on the Air Force managers are becoming more challenging and difficult. Their need for assistance from management science is growing proportionately. (Author)

16. Missile Technology

AD-616 405 Div. 12/1
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
BALLISTIC MISSILE PAYLOAD ALLOCATION,
by Sidney I. Firstman. 12 Nov 59, 22p
Rept. no. P-1839 Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Guided missiles(Surface-to-surface), Payload), (*Payload, Distribution), Weight, Effectiveness, Circular error probable, Targets, Staging, Guided missile warheads, Guidance, Optimization, Design, Dynamic programming, Kill probabilities.

Each element of a ballistic missile's payload--warhead, guidance and penetration aids--will increase in effectiveness with an increase of weight allocated to the element. For a missile that is to be employed against a defended 'point' target, the paper presents a method for determining the optimum division of the missile's payload between the three competing (for weight) elements, when their individual weight-effectiveness relationships are known. For the case of a single missile per target, using a most basic application of the stepwise optimization philosophy of dynamic programming, the problem is formulated as a two-stage weight allocation process. The first stage determines the optimum tradeoff between warhead (lethal radius) and guidance (CEP); the second stage determines the optimum division between penetration aids and an optimum mix of warhead and guidance. The simple arithmetical method that results is demonstrated by an example. The same optimization process is useful for the cases of sequential and simultaneous multiple missile employment per target. (Author)

17. Navigation, Communications, Detection, and Countermeasures

AD-615 773 Div. 6/1
CFSTI Prices: HC$2.00 MF$0.50

Navy Underwater Sound Lab., New London, Conn.
EFFECT OF THEVENIN EQUIVALENT INTERNAL IMPEDANCE ON VELOCITY CONTROL AND ACOUSTIC POWER FOR PLANAR BROADSIDE ARRAYS FOR DIFFERENT DRIVING LEVEL LIMITATIONS.
Research rept.,
by David T. Porter. 28 Apr 65, 46p
Rept. no. USL-648
Proj. 1 452 00 00 Unclassified report

Descriptors: (*Sonar equipment, Acoustic impedance), (*Acoustic impedance, Sonar equipment), Tuning devices, Circuits, Velocity, Control systems, Transducers, Cavitation, Voltage.

A Thevenin equivalent circuit for array elements, which has an input force in series with a radiation impedance ZI, is discussed. The arrays considered are 80-element, close-packed, unshaded arrays, with many different ka and ZI. Four limitations to input voltage are discussed; velocity, transducer voltage, available power, and cavitation. A velocity control factor is presented, where Z12 is the mutual impedance between nearest neighboring pistons. Velocity-limited acoustic power decreased as UCF increased.

AD-615 830 Div. 6/1, 25/1

Defense Research Lab., Univ. of Texas, Austin.
EFFECT OF NOISE CROSSCORRELATION ON BINAURAL SIGNAL DETECTION,
by Ted L. Langford and Lloyd A. Jeffress.
18 Mar 64, 5p Acoustical rept. no. A-239
Contract NObsr72627 Unclassified report

Pub. in Acoustical Society of America. Journal v36 n8 p1455-8 Aug 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Noise, Correlators), (*Acoustic detectors, Correlators), Sound signals, Delay circuits, Auditory acuity.

The effects of varying the crosscorrelation of a noise masker upon the detection of a 500-cps tonal signal were investigated. The correlation was varied by introducing a time delay into the channed to one ear. Ten delays yielding various positive and negative correlations and nine delays yielding zero correlations were employed with in-phase and reversed-in-phase signals. A two-interval forced-choice procedure was used to obtain MLD's ralative to the diotic condition. The function relating MLD's to delay is periodic, the largest values occurring for the anti-phasic conditions and the smallest for the homophasic. The function for zero correlations is not periodic, but decreases regularly to a value near that found for uncorrelated noise. No difference is apparent between the two conditions of signal phase for zero correlations. The temporal interval over which the binaural system is able to effect a correlation between events occurring at the two ears is estimated to be at least 9 msec. (Author)

AD-615 905 Div. 5/2, 8/2
CFSTI Prices: HC$4.00 MF$1.00

Boeing Co., Seattle, Wash. Aero-Space Div.
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
Final technical rept. for 23 Apr-26 Nov 64,
by Rober W. Orth, Darrell R. Jackson, and Glenn B. Coughlan. Apr 65, 149p
Contract AF30 602 3407, Proj. 4519, Task 451902
RADC TR-64-543
Unclassified report

Descriptors: (*Limiters, Nuclear magnetic resonance), (*Radio interference, Limiters), (*Radio antijamming, Limiters), Frequency stabilizers, Electronic counter countermeasures, Selection, Bandwidth, Circuits, Mathematical analysis, Design, Tests, Signals, Radar.

The circuit and quantum mechanical theory of the device was extended and refined. The magnetic properties required to obtain frequency selective limiting over a band of frequencies were determined. Expressions for insertion loss and limiting threshold were derived. The amount of intermodulation and signal suppression was calculated as a function of the interference and signal power levels and the frequency separation between them. The effectiveness of the limiter in suppressing several types of interfering signals was analyzed and an experimental model of a frequency selective limiter operating at 30 mc/sec was designed, constructed and tested. The program confirmed that cw interference can be suppressed without significantly affecting a desired signal which is removed in frequency by only a few cycles per second. It was verified experimentally that the extreme case of limiting, in which an interfering signal was 30 db above a desired signal, required a frequency separation of no more than 64 cps between the two signals to assure negligible intermodulation and suppression of the desired signal.

AD-615 918 Div. 6/1
CFSTI Prices: HC$3.00 MF$0.75

AVCO Marine Electronics Office, New London, Conn.
SOUND REFLECTION AND SCATTERING BY THE OCEAN BOUNDARIES.
1 Dec 63, 93p
Unclassified report

Descriptors: (*Underwater sound, Sound transmission), (*Sound transmission, Scattering), (*Sonar, Sound transmission), Propagation, Distortion, Ocean bottom, Sonar signals, Boundary value problems, Reflection, Mathematical models, Surfaces, Doppler effect, Statistical analysis, Graphics, Tables.

The report concerns the effects of irregular boundaries upon the propagation of waves. These effects are predicted and interpreted according to theory connecting; (a) quantitative descriptions of the boundaries; (b) scattering by rough boundaries; (c) wave propagation models.

AD-615 952 Div. 33/1
CFSTI Prices: HC$3.00 MF$0.50

National Aviation Facilities Experimental Center, Atlantic City, N. J.
EVALUATION OF PLAN FOR CENTRAL APPROACH CONTROL FACILITY AT JACKSONVILLE.
Final rept.,
by S. B. Rossiter. May 65, 53p
Proj. 150 519 01V
SRDS RD-65-43
Unclassified report

Descriptors: (*Approach, Air traffic control systems), (*Air traffic control systems, Approach), Landing fields, Runways, Florida, Simulators, Feasibility studies.

An evaluation of a proposed plan for consolidating the

functions of three separate approach control facilities in the Jacksonville, Florida terminal area into one Central Approach Control Facility was conducted using the Model B Dynamic Air Traffic Control Simulator at the National Aviation Facilities Experimental Center, Atlantic City, New Jersey. The plan was tested, using two different runway configurations, for the purpose of optimizing the plan and determining its feasibility for handling the peak hour volume of traffic generated by Imeson, Navy Jacksonville and Navy Cecil Airports. The report contains a documentation of the optimized plan indicating terminal flow patterns, control procedures, airspace utilization and equipment configuration. It was concluded that the plan was feasible for handling the specified peak hour traffic and it was recommended that consideration be given to using these procedures for the proposed Jacksonville Central Approach Control Facility. (Author)

AD-615 953 Div. 5/2
CFSTI Prices: HC$2.00 MF$0.50

Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
Final rept.,
by Clair R. Morris. Apr 65, 28p Rept. no. RD-65-20
Proj. 221 140 01C

Unclassified report

Descriptors: (*Earphones, Design), (*Radio communication systems, Transmitter-receivers), (*Transmitter-receivers, Radio communication systems), Microphones, Radio equipment, Radio receivers, Radio transmitters, Costs, Reliability, Air traffic controllers.

The report contains the results of the development and evaluation of a wireless microphone/headset/channel selection device designed to determine the feasibility of replacing the cord-connected headset presently used. These headsets now used by the air traffic controller and coordinator are physically connected by cords to the operating console or position. The cords limit the mobility of the user and interfere with the operation of the control and display equipment. The system developed used very low-powered radio link equipment to provide communication between the controller and his operating position. The results of the development indicate that a wireless system is feasible and desirable for operator comfort and mobility but it is limited in practicability due to cost and marginal reliability. The development was discontinued due to the fact that the requirement for operator mobility has been decreased in the new concept of air traffic control. Recommendations are made to continue efforts to improve the presently used cord-connected headset and operating position. (Author)

AD-615 954 Div. 6/6, 8/7, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
DETECTION OF SIGNALS IN A STREAM OF PULSES,
by R. V. Ambartsumyan. 13 May 65, 10p
FTD-TT-65-42
TT 65-62404

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Doklady v38 n2 p71-6 1964. Available copy will not permit fully legible reproduction.

Descriptors: (*Detection, Signals), (*Electromagnetic pulses, Detection), Probability, Game theory, Noise-(Radio).

AD-615 975 Div. 5/2, 30/2
CFSTI Prices: HC$2.00 MF$0.50

Motorola, Inc., Chicago, Ill. Communications Div.
DATA TRANSMISSION INVESTIGATION (SHORT RANGE HF RADIO DATA TRANSMISSION).
Quarterly progress rept. no. 1, 4 Jan-3 Apr 65,
by Roger F. Salava. 3 Apr 65, 43p
Contract DA28 043AMC00478E,
Task 1E6 34301D246 09 03

Unclassified report

See also AD-424 183.

Descriptors: (*Radio communication systems, Data transmission systems), (*Data transmission systems, Radio communication systems), High frequency, Propagation, Attenuation, Phase studies, Environmental tests, Multipath transmission, Magnetic recording systems, Bandwidth.

The document reports on the short range HF data transmission study to be conducted in the vicinity of Fort Monmouth, New Jersey. During the reporting period, modifications to the data logging system incorporating and incremental magnetic recorder are described and the field test program that is planned is discussed. The field tests will include (1) data transmission tests with and without inband diversity, (2) phase measurement tests. (3) fade measurement tests and (4) multipath measurement tests. (Author)

AD-615 980 Div. 19/1, 12/2, 19/4
CFSTI Prices: HC$3.00 MF$0.75

P. E. C. Research Associates, Inc., Boulder, Colo.
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
Final rept.,
by Saul A. Basri and Willard C. Humphreys. Feb 65, 60p
Contract AF19 628 3997, Proj. 8654, Task 865402
AFCRL 65-159

Unclassified report

Descriptors: (*Celestial navigation, Spacecraft), (*Space navigation, Position finding), (*Celestial mechanics, Space navigation), Optimization, Relativity theory, Differential geometry, Lasers, Electromagnetic waves, Propagation, N-body problem.

This study develops methodologies for coordinate fixing from measurements made on board a space craft in mid-flight. Both the problems of locations of the craft itself and location of events outside the craft are considered and a unified treatment of both problem areas is given. An error-minimization strategy is presented for the selection of reference frame in which to express the vehicle's position. Position determination via distance measurements and via angular separation measurements are considered in detail and an explicit solution of the equations arising in the latter case is given. The main purpose of the work reported in section two was to investigate and solve the problems met in the positioning and description of motion objects within the solar system. This is accomplished with the help of Einstein's general theory of relativity, which is briefly reviewed. It is found that the deflection in direction of an electromagnetic signal and corrections to angular measurement by means of such signals due to the presence of matter, are negligible within the solar system, except in the neighborhood of the sun. The corrections necessary in the calculation of distances from measurement the round trip time of laser beams are of the order of 10 to the minus 7th power sec. The doppler and gravitational frequency shifts are also measureable. (Author)

AD-615 981 Div. 5/2, 8/4, 25/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
MAGNETOMETER,
by B. K. Bushuev. 7 May 65, 4p FTD-TT-65-1383
TT 65-62407

Unclassified report

Unedited rough draft trans. of Russian Patent 154 674, appl. no. 767208/22-3, 1 Mar 62.

Descriptors: (*Magnetometers, Loudspeakers), (*Loudspeakers, Radio communication systems), (*Magnetic fields, Intensity), Determination, Magnets, Patents, USSR.

Object of the Invention: The use of an electron tube, as a sensitive element, for the sensitive element in determining the intensity of a magnetic field, particularly, for fixing the degree of magnetization of permanent magnets of radio dynamic loudspeakers. (Author)

AD-616 005 Div. 19/3
CFSTI Prices: HC$3.00 MF$0.75

Eclipse Pioneer Div., Bendix Corp., Teterboro, N. J.
ANALOG COMPUTER STUDY OF CATEGORY III ILS AIRBORNE AND GROUND EQUIPMENT STANDARDS.
Final rept., phase 4.
Sep 64, 66p
Contract ARDS451, Projs. 114 1312D, AD1091
SRDS RD-65-61

Unclassified report

Descriptors: (*Instrument landings, Standards), Glide path systems, Approach, Radio altimeters, Ground support equipment, Airborne, Errors, Analog computers, Wind.

This report contains the results of analog computer automatic ILS instrument landing system) approach studies which determined: (1) the allowable centering and beam width tolerances of the localizer and glide slope transmitters and airborne receivers and indicators. (2) the allowable automatic approach coupler tolerances and wind shear performance. (3) the allowable radio altimeter and flare computer errors. (Author)

AD-616 006 Div. 19/4
CFSTI Prices: HC$3.00 MF$0.75

Instrumentation Lab., Mass. Inst. of Tech., Cambridge.
ADVANCED INERTIAL GYRO TEST EQUIPMENT DESIGNS.
Task rept.,
by Jack H. Arabian. Oct 64, 54p Rept. no. E-1613
Contract AF29 600 3916, Proj. 52 205
MDC TR-65-5

Unclassified report

Prepared for presentation at the Inertial Guidance Test Symposium (2nd), Holloman AFB, N. Mex., 7-9 Oct 64.

Descriptors: (*Inertial guidance, Gyroscopes), (*Gyroscopes, Inertial guidance), Inertial navigation, Test equipment(Electronics), Electronic equipment, Design.

The report discusses the most advanced test equipment designs as tools for accomplishing precision gyro testing. Behavior of the single-degree-of-freedom gyroscope is analyzed with respect to electronic equipment and ambient variations. Long-term reliability and non-interruptible runs are investigated, with methods and feasibility included. Emphasis is placed on the need for compatibility of the testing system electronics with the navigation system electronics so that calibration constants and design parameters remain identical. (Author)

AD-616 065 Div. 6/1

Lockheed Missiles and Space Co., Palo Alto, Calif.
OPTICAL-CORRELATION DETECTOR FOR THE AUDIO FREQUENCY RANGE,
by J. K. Parks. 8 Sep 64, 10p

Unclassified report

Pub. in The Journal of The Acoustical Society of America v37 n2 p268-77 Feb 1965.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Correlators, Acoustic detectors), (*Acoustic detectors, Correlators), Statistical functions, Audiofrequency, Integrators, Performance(Engineering).

A noncoherent optical-correlation detector of the stored reference type is described. The correlator performs real-time correlation of multiple delayed signals with the stored reference without a priori knowledge of the signal delays. The correlator makes use of real-time integration, thereby making it unnecessary to record received signals prior to correlation. An experimental version of the correlator is described, its performance is analyzed, and the predicted performance is compared with the observed performance and found to agree to within 3 dB. A signal-processing gain of 20 dB is obtained with the experimental version of the correlator. (Author)

AD-616 185 Div. 12/6, 12/2

Stanford Univ., Calif.
VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
Revised ed.,
by Robert H. Cannon, Jr. and Walter G. Eppler, Jr.
20 Nov. 64, 11p
Grant NsG133 61

Unclassified report

Prepared in cooperation with Lockheed Missiles and Space Co., Palo Alto, Calif.
Pub. in Journal of Spacecraft and Rockets v2 n2 p172-82 Mar-Apr 1965 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 12 Aug 64.

Descriptors: (*Spacecraft, Attitude control systems), (*Attitude control systems, Spacecraft), Display systems, Control sticks, Satellite attitude, Celestial guidance, Reticles.

Two concepts, the vector reticle and control action display, are submitted as effective means for making manual three-axis attitude control quicker and more efficient while reducing substantially the concentration required of the pilot. A system design is submitted in which the two concepts are combined in a control action reticle and in which the pilot has direct control of the jet valves. (The entire system may be mechanical.) The system is controlled to a visual reference or to an instrument attitude reference. Malfunction of the system cannot interfere with normal manual control. The vector recticle presents all auxiliary information in a single three-part geometric vector superimposed on the window (rather than on three separate dials, for example), thus reducing the number of quantities to be monitored from

three to one. Control action display gives the pilot instantaneous and exclusive control of the reticle, thus removing the need for two mental integrations and greatly reducing the concentration required for tracking. Results are presented of three-axis (fixed-base) simulation studies of the proposed system and of other systems for comparison. (Author)

AD-616 255 Div. 6/7, 2/10
CFSTI Prices: HC$4.00 MF$0.75

UED Earth Sciences Div., Teledyne Systems Co., Alexandria, Va.
SEISMIC PARTIAL COHERENCY STUDY.
Seismic Data Lab. rept.,
by James C. Bradford, L. D. Enochson, and G. P. Thrall. 28 Apr 65, 102p Seismic-DLR-121
Contract AF33 657 12447, Proj. VELA T2037, ARPA Order 624

Unclassified report

Rept. on Proj. VELA-UNIFORM.
Rept. prepared in cooperation with Measurement Analysis Corp., Los Angeles, Calif.

Descriptors: (*Seismic waves, Data), (*Mathematical models, Seismic waves), Signal-to-noise ratio, Statistical functions, Stochastic processes, Seismographs.

Computational experiments have been conducted on a digital computer to illustrate numerically the usefulness of partial coherence techniques. The numerical results obtained demonstrate the necessity of employing partial coherence functions when a multi-input-single output linear system is involved. Two seismic noise traces were randomly selected from available Seismic Data Lab sources and were combined in various ways to obtain two correlated input traces and an output trace. From this data, gain factors and coherence functions were computed in two ways. First, just one input and one output were employed in the computations. Second, both inputs were accounted for. The numerical results vividly illustrate the biased answers obtained when only the single input and output are considered. This is contrasted with the correct results obtained via the proper model of a two input system. These procedures were also extended to a three input-single output system where the third input was ignored. In this case the application of partial coherence functions as an indicator of the existence of the third neglected seismic data source is illustrated. (Author)

AD-616 268 Div. 5/4, 4/4
CFSTI Prices: HC$2.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ELEMENTS OF AN ELECTROLUMINESCENT SCREEN,
by I. Ya. Lyamichev. 13 May 65, 26p
FTD-TT-65-30
TT 65-62430

Unclassified report

Trans. of Tekhnika Kino i Televideniya (USSR)
v6 n2 p37-48 1962.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Viewing screens, Electroluminescence), (*Electroluminescence, Viewing screens), Brightness, Display systems, Circuits, Resistance(Electrical), USSR.

Various arrangements of an element of a screen are discussed, transforming an electric signal into a visible image of necessary brightness. An analysis is made of proposed schemes. (Author)

AD-616 275 Div. 5/4, 8/3
CFSTI Prices: HC$3.00 MF$0.75

Polytechnic Inst. of Brooklyn, N. Y. Microwave Research Inst.
PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
Scientific rept.,
by S. Deutsch and P. Balaban. Dec 64, 53p
PIBMRI-1256-65
Contract AF19 628 3815, Proj. 4610, Task 461007
AFCRL 65-29

Unclassified report

Descriptors: (*Television display systems, Pseudo-random systems), (*Pseudo-random systems, Television display systems), Radio relay systems, Communication theory, Phosphorescent materials, Visual acuity.

The principal psychophysical requirements of the human eye are satisfied by a television frame frequency of 1 or 2 cycles/sec. To avoid flicker with such low frame rates, a pseudo-random dot scan is employed in conjunction with long-persistence phosphors. Experiments show that 15% dot flicker is tolerable. Ten systems are discussed, including a two-million-element picture with 4 mc/sec bandwidth; tape recording at 15 inches/sec; the continuous relaying of satellite pictures; short-wave transmission; phonevision; and very low frame rate applications that use a scan conversion system. (Author)

AD-616 420 Div. 6/6
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE RESOLVABILITY OF POINT SOURCES,
by Peter Swerling. 8 Dec 59, 27p
Rept. no. P-1862

Unclassified report

Prepared for presentation at the symposium on Decision Theory at Rome Air Development Center, May 60.

Descriptors: (*Radar targets, Resolution), (*Resolution, Radar targets), Noise(Radar), Gain, Decision theory, Antenna lobes, Probability, Sources.

The problem investigated is the resolvability, in the presence of noise, of point sources which are separated in azimuth by less than the width of the main lobe of the gain pattern. The probability of correctly resolving two sources is derived for a particular class of decision methods as a function of the strengths of the sources, their angular separation and noise level. Numerical results are presented for a case which corresponds more accurately to optical or infrared devices than to radar. (Author)

18. Nuclear Science and Technology

AD-615 776 Div. 20/3, 25/4
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y.
PHOTOIONIZATION OF KRYPTON AND ARGON IN THE 100-300 ANGSTROM RANGE,
by R. W. Alexander, Jr. Jun 65, 17p
Technical rept. no. TR-12
Contract Nonr40137, Proj. NR017 625
Unclassified report

Descriptors: (*Photoelectric effect, X rays), (*Helium group gases, Photoelectric effect), Argon, Krypton, Electron transitions, Ultraviolet radiation.

The photoionization cross section of argon and krypton was measured in the 100 to 300 angstrom range. A shallow minimum was found at 270 angstroms, in agreement with a calculation by Cooper. For krypton, the M4,5 edge was found at about 133 angstroms in agreement with the findings of Codling and Madden. For argon, several sum rules on the oscillator strengths were evaluated. Excellent agreement was found for the Thomas-Reiche-Kuhn sum rule. For the sum rules in 1/E and 1/Esq, the agreement with experiment was poor. This is attributed to a lack of experimental values for the oscillator strengths of the discrete transitions. (Author)

AD-616 013 Div. 20/3

Battelle Memorial Inst., Columbus, Ohio.
RADIATION EFFECTS IN GaAs.
Revised ed.,
by L. W. Aukerman, P. W. Davis, R. D. Graft, and T. S. Shilliday. 7 Jan 63, 10p
Unclassified report

Pub. in Journal of Applied Physics v34 n12 p3590-9 Dec 1963 (Copies not available to DDC or Clearinghouse customers)
Supported by Aeronautical Research Lab., U. S. Air Force.

Descriptors: (*Radiation damage, Semiconductors), (*Semiconductors, Radiation damage), (*Gallium alloys, Arsenic alloys), Heat treatment, Resistance(Electrical), Atomic energy levels, Neutrons, Light transmission, Attenuation, Heat of activation, Electrical properties, Optical properties, Tellurium alloys, Cadmium alloys, Sulfides, Cadmium compounds.

Comparison of the annealing properties of radiation-induced conductivity changes in GaAs indicates that about 10% of the damage created by reactor irradiations anneals in a manner quite similar to but not identical with that created by 1-MeV electrons. The remaining neutron damage requires much higher annealing temperatures and is presumed to result from complicated damage structures characteristic of highly energetic knock-on atoms (e.g., disordered regions). Heavy neutron irradiation of either p- or n-type GaAs results in very high resistivities which appear to be influenced by the presence of slow surface states. Energy levels resulting from neutron irradiation are estimated to lie at approximately 0.1 and 0.5 eV below the conduction band and at 0.6 eV above the valence band. Moderate irradiation of GaAs by fast neutrons gives rise to a continuous optical absorption spectrum for wavelengths beyond the fundamental absorption edge, with the absorption increasing as the inverse square of the wavelength. Similar behavior occurs in CdTe and CdS after neutron irradiation. Although this effect is not well understood, it is suspected of being associated with defect structures characteristic of fast neutron bombardment, since heavy bombardment with electrons does not produce the same behavior. (Author)

AD-616 048 Div. 20/3, 15/1

Palmer Physical Lab., Princeton Univ., N. J.
LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY,
by M. L. Goldberger and K. M. Watson. 30 Jul 64, 12p
Contract AF49 638 1333, Proj. 9751, Task 975101
AFOSR 65-0842
Unclassified report

Pub. in Physical Review v136 n5B pB1472-80 Dec 7 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Decay schemes, S-matrix), (*S-matrix, Decay schemes), Resonance scattering, Probability, Relativity theory, Quantum mechanics, Elementary particles.

An investigation is made of the possible time dependence of decay laws for unstable particles. The probability P(t) that an unstable particle has not decayed at time t is expressed in terms of S-matrix quantities. It is concluded that, contrary to popular belief, the exponential decay law P = exp (-gamma t) is only one of a discrete set of possible decay laws. (Author)

AD-616 199 Div. 20/1

Bartol Research Foundation, Franklin Inst., Swarthmore, Pa.
ON THE SECOND 2 + LEVEL OF Ni(58),
by S. M. Shafroth and G. T. Wood. 1961, 3p
Grant AF AFOSR401 63, Proj. 9751
AFOSR 65-0820
Unclassified report

Pub. in Comptes Rendus du Congres International de Physique Nucleaire Paris France v2 p476-7 1964 (Copies available only to DDC users).

Descriptors: (*Nickel, Nuclear energy levels), (*Nuclear energy levels, Nickel), Gamma rays, Phonons, Coincidence counting, Nuclear shell models, Stable isotopes, Spectroscopy.

The report investigates the 2+ level of Ni(58) by studying the radiations from Cu(58), Ni(60), Ni(62), and Ni(64), all appear to show harmonic structure with two-phonon triplets, whereas Ni(58) may be in a transitional region having some vibrational and some shell model properties. The study gives a measurement of the E2/M1 mixing ratio for the 2+' yields 2+ transition, which illuminates this point. Two window counters and a spectrum counter are used to record coincidence spectra. (Author)

AD-616 245 Div. 20/3, 25/2
CFSTI Prices: HC$1.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MeV ENERGY RANGE.
Physical sciences research papers,
by Edward A. Burke, Neil J. Grossbard, and Lester F. Lowe. Apr 65, 25p
Rept. no. PSRP-99, AFCRL-65-286
Proj. 5620, Task 562002
Unclassified report

Descriptors: (*Crystals, Radiation damage), (*Electron bombardment, Nuclear cross sections), (*Radiation damage, Nuclear cross sections), Atoms, Scattering, Probability, Atomic properties, Energy,

Vanadium, Copper, Rhenium, Palladium, Tantalum, Tungsten, Iridium, Platinum, Gold, Differential equations, Programming(Computers).

In deriving atomic displacement threshold energies from electron bombardment data it is necessary to employ numerical values of the electron scattering cross section calculated over a range of electron energies. For relativistic energies the Mott-Rutherford cross-section formula may be used. A computer program was developed to evaluate this formula for any value of atomic number and electron energy. The program is described and numerical values presented for atomic numbers 23, 29, 45, 46, 73, 74, 77, 78, and 79; electron energies between 1.0-3.0 MeV; and appropriate assumed threshold values. (Author)

AD-616 247 Div. 20/3, 14/2, 14/8, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Radiation Effects Information Center, Columbus, Ohio.
MONTHLY ACCESSION LIST. ABSTRACT NO. 27565 TO 27614, PART I.
Rept. for 1-31 May 65.
10 Jun 65, 22p
REIC Accession list no. REIC-AL-87
Contract AF33 615 1124 Unclassified report

Continuation of Contract AF33 657 10085
See also AD-614 8985.

Descriptors: (*Bibliographies, Radiation damage), (*Radiation damage, Materials), (*Materials, Radiation damage), Radiation chemistry, Metals, Ceramic materials, Organic materials, Polymers, Inorganic compounds, Electronic equipment, Semiconductor devices, Electron accelerators, Nuclear physics laboratories, Nuclear reactors, Space environmental conditions, Radiation measurement systems, Abstracting.

Contents:
Abstracts on the following: metallic materials; ceramic materials; organic materials; polymeric materials; inorganic materials; electronic materials, components, and devices; space environment and effects on materials; experimental devices and techniques.

AD-616 248 Div. 20/3, 14/2, 14/8, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Radiation Effects Information Center, Columbus, Ohio.
MONTHLY ACCESSION LIST COORDINATE INDEX, PART II.
Rept. for 1 Oct 64-31 May 65.
10 Jun 65, 13p Unclassified report

See also AD-616 247.

Descriptors: (*Radiation damage, Indexes), (*Materials, Radiation damage), Radiation chemistry, Metals, Ceramic materials, Organic materials, Polymers, Inorganic compounds, Electronic equipment, Semiconductor devices, Electron accelerators, Nuclear physics laboratories, Nuclear reactors, Space environmental conditions, Radiation measurement systems, Dosimeters.

AD-616 403 Div. 20/2, 20/1, 15/1

RAND Corp., Santa Monica, Calif.
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE,
by Richard Bellman, Robert Kalaba, and G. Milton Wing. 9 Nov 59, 21p Rept. no. P-1835
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Neutron transport theory, Invariance), (*Diffusion, Neutron transport theory), (*Integral equations, Neutron transport theory), Nonlinear differential equations.

Diffusion theory classically has been regarded as an approximation to the more rigorous (but, of course, not completely rigorous) transport theory under the assumption of high velocity and small mean free path. Furthermore, passage to the limit in the 'telegrapher's equation,' a linear partial differential equation of hyperbolic type, has been carried out. The limits are studied of the non-linear functional equations obtained from the transport processes with finite velocity as the velocity increases without bound. Corresponding results are obtained for heat or diffusion processes, where the physical picture is not as clear. The equations can be interpreted in such a way as to be derived by invariant imbedding techniques. In all cases, the equations are of the generalized Riccati type which are characteristic of these processes of mathematical physics.

AD-616 416 Div. 20/2, 20/1, 15/1
CFSTI Prices: HC$4.00 MF$1.00

RAND Corp., Santa Monica, Calif.
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
Revised ed.,
by Richard Bellman, Robert Kalaba, and G. Milton Wing. 21 Mar 60, 116p Rept. no. P-1858
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Revision of manuscript submitted 1 Feb 60.

Descriptors: (*Neutron transport theory, Invariance), (*Integral equations, Neutron transport theory), (*Diffusion, Neutron transport theory), (*Iterative methods, Transformations(Mathematical)), Scattering, Numerical methods and procedures, Digital computers, Neutron flux.

Using invariance principles in a systematic fashion, new analytic formulations are derived of the classical particle processes, those of transport theory, radiative transfer; random walk, multiple scattering, and diffusion theory, as well as new computational algorithms which seem well fitted to the capabilities of digital computers. Whereas the usual methods reduce problems to the solution of systems of linear equations, here the problems are reduced to the iteration of nonlinear transformations. (Author)

19. Ordnance

AD-615 895 Div. 22/1
CFSTI Prices: HC$1.00 MF$0.50

Picatinny Arsenal, Dover, N. J.
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES,
by W. R. Tomlinson, Jr. 11 Jan 44, 17p
Progress rept. no. PR-2; TR-1379

Unclassified report

Declassified 11 Jan 56.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Explosive materials, Physical properties), (*Tetryl, Mixtures), (*RDX, Mixtures), (*TNT, Mixtures), (*PETN, Mixtures), Stability, Explosion gases, Antiaircraft ammunition, Fragmentation, Detonations, Explosion effects.

In connection with the study of ternary mixtures of high explosives the pourabilities of four compositions were investigated. The explosive properties of the following mixtures, which were found to be pourable were determined: (1) 65% Tetryl - 21% Cyclonite - 14% TNT; (2) 28% PETN - 43.2% Cyclonite - 28.8% TNT; (3) 55% Haleite - 18% Tetryl - 27% TNT; (4) 55% Haleite - 13.5% PETN - 31.5% TNT. The Haleite ternaries are on what may be considered the borderline of stability. Mixture (1), designated PTX-1, was found to exert a somewhat lesser fragmentation effect, in the 3 in., A.A., M42 Shell, than RDX Composition B, but had a sand test value somewhat greater than that of the latter. Its explosive and physical properties are such that (1) it would offer advantages, over Tetrytols, in brisance and power for use in mines, and other components where Tetrytols are now used, and, (2), in addition, may be considered as a substitute for RDX Composition B to conserve Cyclonite. A saving of 39 lb. Cyclonite per 100 lb. explosive would be affected by its use. Mixture (2), designated PTX-2, was found to have a higher sand test value than either 50/50 Pentolite or RDX Composition B. It was more brisant in the Fragmentation Test than the latter, and had a rate of 8010 m/s as compared to 7530 m/s for RDX Composition B. These explosive characteristics indicate it to have potentialities for uses where powerful, brisant filler are required, in particular, as a charge for fragmentation-ammunition and shaped charges. (Author)

AD-615 984 Div. 22/6

Foreign Technology Div., Wright-Patterson AFB, Ohio.
SPECTROSCOPIC INVESTIGATION OF THE STATE OF GAS BEHIND A DETONATION FRONT,
by R. I. Soloukhin and T. A. Sharapova. 13 May 65, 11p FTD-TT-65-33
TT 65-62410

Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n2 p37-41 1962. Document is not reproducible and is available from the Clearinghouse on loan only.

Descriptors: (*Detonations, Spectroscopy), Aliphatic compounds, Oxygen, Mixtures, Explosion gases, Shock waves, USSR.

Data are presented on distribution of illumination and gas temperature behind a detonation front in acetylene-oxygen mixtures. The existence was noted of a non-equilibrium concentration of C2 in the narrow zone, adjoining the wave front. Gas temperatures were measured by a general method of turning spectral lines.

AD-616 154 Div. 22/6, 22/13

Naval Research Establishment, Darmouth (Nova Scotia).
ENERGY PER UNIT-AREA SPECTRUM OF THE SHOCK WAVE FROM 1-LB TNT CHARGES EXPLODED UNDERWATER,
by J. H. Stockhausen. 7 Apr 64, 1p

Unclassified report

Pub. in Acoustical Society of America. Journal v36 n6 p1220-1 Jun 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shock waves, Underwater explosions), (*TNT, Underwater explosions), Energy, Acoustics, High frequency, Canada.

Measurements were made of the energy per unit-area spectrum level of the shock wave 100 yd from 1-lb TNT charges exploded underwater. Over the frequency range covered, 0.1-25 kc/sec, the measurements were in agreement with values calculated, using peak pressures and time constants reported by Arons. In particular, the decrease in spectrum level with increasing frequency of 6 dB per octave at high frequencies, characteristic of pulses with short rise times, continued up to the high-frequency limit of the measuring equipment. (Author)

AD-616 304 Div. 22/1, 8/2
CFSTI Prices: HC$1.00 MF$0.50

Naval Weapons Lab., Dahlgren, Va.
PROPOSED FILTERED SHIELDED CONNECTOR FOR PROTECTION OF WEAPONS FROM ELECTROMAGNETIC RADIATION.
Technical memo.,
by M. F. Walther. Jun 65, 13p Rept. no. W-7/65

Unclassified report

Descriptors: (*Electromagnetic shielding, Weapons), (*Weapons, Electromagnetic shielding), Hazards, Countermeasures, Explosives initiators.

AD-616 348 Div. 22/4, 22/1, 22/5, 2/5
CFSTI Prices: HC$3.00 MF$0.50

Barodynamics, Inc., Georgetown, Colo.
PENETRATION OF PROJECTILES INTO FROZEN GROUND,
by Clifton W. Livingston and Howard L. Waldron. Mar 65, 51p
Contract DA11 190ENG94, Task 8S66 02 001
CRREL TR-93

Unclassified report

Descriptors: (*Projectiles, Penetration), (*Permafrost, Terminal ballistics), (*Polar regions, Terminal ballistics), (*Terminal ballistics, Permafrost), Army, Bombs, Bomb components, Vulnerability, Bombing, Ammunition.

During three field tests, 30 live and 75 inert bombs were dropped from helicopters into unfrozen, shallowly frozen, and deeply frozen ground at striking velocities ranging from 252 to 800 ft/sec. The bombs were divided into 3 series: 2.50, 2.75, and 3.25 in. diam, weighing 30, 40, and 66 lb each, respectively. In each series, 29 bombs were made geometrically similar. In addition, for each diameter 3 bombs were made shorter and longer in order to check the effect of different geometry. Bomb specifications included epoxy adhesive (to cement bomb parts), large plastic tail fin and righting movement arm, slenderness of bomb body, and sharpness of the nose. For a given bomb, penetration of the nose is shown to be a straight-line function of striking velocity in ft/sec. This is in accordance with the Livingston penetration equation based on an analogy between plastic deformation and fluid-flow. Penetrations up to 25 ft were achieved. (Author)

AD-616 425 Div. 22/11, 30/3

RAND Corp., Santa Monica, Calif.
HOW MUCH AUTOMATICITY FOR CHECKOUT EQUIPMENT,
by Sidney I. Firstman. 4 Jan 60, 25p
Rept. no. P-1867

Unclassified report

Available only ior reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Checkout equipment, Automatic), Control systems, Checkout procedures, Weapon systems.

20. Physics

AD-615 764 Div. 8/6, 2/7
CFSTI Prices: HC$2.00 MF$0.50

Ionosphere Research Lab., Pennsylvania State Univ., University Park.
THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBER-DECEMBER, 1964,
by Anthony J. Ferraro and Hai Sup Lee. 1 Mar 65, 30p
Scientific rept. SR-236
Contract AF19 628 4014, Proj. 8605, Task 860502
AFCRL 65-183
Unclassified report

See also AD-610 221.

Descriptors: (*Ionosphere, Luxemberg effect), (*Radio waves, Ionospheric propagation), Radio transmission, Refractive index, Tables, Attenuation, Amplitude modulation, Phase measurement.

The objective of the present work is to study the properties of ionospheric D-region using radio wave interaction effect which is also commonly known as Luxembourg effect. The present technique closely follows that developed by Fejer for radio wave amplitude interaction experiment. However, the technique of measurement as well as the theory of radio wave interaction was extended and generalized at the Ionosphere Research Laboratory by the introduction of complex coefficient of interaction, to embody the effect of interaction on both the amplitude and the phase of radio waves.

AD-615 770 Div. 9/1
CFSTI Prices: HC$2.00 MF$0.50

Naval Weapons Lab., Dahlgren, Va.
ON THE BIRTH AND DECAY OF VORTICES,
by Hans J. Lugt and Ernst W. Schwiderski. Apr 65, 41p NWL-1972
Task R360FR103 2101R01101001
Unclassified report

Descriptors: (*Vortices, Theory), Fluid mechanics, Rotation, Cylindrical bodies, Laminar flow, Mathematical analysis.

Complete sets of time-dependent solutions for Stokes' slow-motion equations are consturcted by means of a generalized separation technique, which was recently introduced and applied by the authors to steady-state flows. Under certain boundary and regularity conditions, such integrals of slow motion can be used to derive solutions of the quasi-linear Navier-Stokes equations in an exact linear manner. The classes of separable solutions, which are presented in the paper, reveal significant mathematical properties of laminar motions concerning their uniqueness and regularity. From the physical point of view, they render valuable information on the mechanism of growing and dying vortices. For instance, it can be shown that a decaying discontinuity line is a process which involves the gradual obliteration of a discrete spectrum of vortices in such a way that little vortices with large damping coefficients dominate first, and that bigger vortices of fewer number replace them with advancing time. This model conforms with photographs by Weske and Rankin. Furthermore, the development and decay of individual vortices together with their energy supply are investigated. (Author)

AD-615 777 Div. 25/1, 30/2
CFSTI Prices: HC$3.00 MF$0.75

Ordnance Research Lab., Pennsylvania State Univ., University Park.
A COMPUTER STUDY OF UNDERWATER SOUND RAYS AND REFRACTION EFFECTS,
by J. P. Beam. 2 Apr 64, 64p
Technical memo. no. TM-202.3941-04
Contracts NOw 63 0209c, NOrd16597
Unclassified report

Descriptors: (*Underwater sound, Propagation), (*Programming(Computers), Underwater sound), Acoustics, Tests, Oceanographic equipment.

The thesis documents the development, testing and early use of a computer program which plots sound rays and calculates a continuous value for the refractive anomaly. The first chapter contains a brief discussion of the meaning of the refractive anomaly A. Chapter 2 and 3 contain a functional description of the program which uses the second derivative of the velocity with respect to depth as a description of the medium. In order to test the program, computer results are compared with mathematical results predicted by theory (Chapter 4) and the two are shown to be in excellent agreement. Chapter 5 contains a detailed study of ray and refractive anomaly plots made with the computer program. Finally, Chapter 6 contains a summary. (Author)

AD-615 780 Div. 25/3, 2/1, 2/6, 9/1
CFSTI Prices: HC$1.00 MF$0.50

Stevens Inst. of Tech., Hoboken, N. J.
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
by Winston H. Bostick, Hugh W. Byfield, Philip J. Casale, and Joseph N. DiMarco. Mar 65, 16p
Scientific rept. no. SR-1, SIT-P144
Contract AF19 628 2398; Grant AF AFOSR465 65, Projs. 8608, 8647, Tasks 860803, 864701
AFCRL 65-293
Unclassified report

Descriptors: (*Plasma medium, Gas flow), (*Gas flow, Magnetic fields), (*Terrestrial magnetism, Solar wind), (*Solar wind, Simulation), Upper atmosphere, Configuration, Magnetohydrodynamics, Vortices, Turbulent boundary layer, Atmosphere models, Copper, Lithium.

Image converter photographs of plasma flow over a magnetic dipole field exhibit general boundary shapes which are in accord with the theoretical shapes computed on the basis of specular reflection of the ions at the boundary of the magnetic cavity. Magnetic probe measurements show that the magnetic field is highly turbulent in the magnetic boundary and correlation measurements show that this turbulence is not a breathing of the boundary as a whole, but a corniness in the direction perpendicular to the magnetic field and the initial plasma flow. Electric-field probe and ion density probe measurements also show that plasma is turbulent in the boundary of the magnetic cavity, and that the plasma penetrates the cavity in a turbulent state. The character of the signals suggests that the turbulence is in the form of plasma eddies or vortices. (Author)

AD-615 785 Div. 8/6
CFSTI Prices: HC$3.00 MF$0.75

Raytheon Co., Norwood, Mass.
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA.
Final rept. for Oct 62-Mar 65,
by Carson K. H. Tsao. Apr 65, 61p
Contract AF19 628 2362, Proj. 4600, Task 460008
AFCRL 65-299
Unclassified report

Descriptors: (*Wave transmission, Rock(Geology)),

(*Rock(Geology), Wave transmission), (*Radio waves, Propagation), Electrical properties, Experimental data, Underground antennas, Radio communication systems.

Experiments in the transmission of radio waves through subsurface rock strata were conducted on Cape Cod, Massachusetts, in the Adirondack region of New York, and in the Cheyenne Mountain area of Colorado. Linear vertical antennas were placed in deep drill holes. The transmission path lengths were 1 mile on Cape Cod and 1 and 3 miles in the Adirondack region. At Cheyenne Mountain, where the up-over mode was emphasized, the path through the rock was approximately 700 feet. The subsurface media encountered in these areas were found to be quite inhomogeneous, and on the whole, to have relatively high values of conductivity, larger than 10 to the minus 4th power mhos/meter. Several techniques were used to ascertain whether the transmissions were due to radio waves propagating directly through the rock strata or via the 'up-over-and-down' path. The bulk conductivities of the rock media along the transmission paths were deducted from measurements of the attenuation and the phase constants. The local conductivities in the vicinity of the drill holes were deduced from the measured impedance characteristics of the antennas. An improved antenna probe technique was used to determine the fine-grain variations of conductivity with depth in the drill holes. (Author)

AD-615 794 Div. 8/6, 8/1
CFSTI Prices: HC$2.00 MF$0.50

Raytheon Co., Norwood, Mass.
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN.
Interim rept.,
by Carson K. H. Tsao. Mar 65, 36p
Scientific rept. no. SR-7
Contract AF19 628 2362, Proj. 4600, Task 460008
AFCRL 65-298

Unclassified report

Descriptors: (*Radio transmission, Underground antennas), (*Underground antennas, Radio transmission), Feasibility studies, Radio communication systems, Measurement, Teletype systems, Low frequency, Propagation, Mountains, Conductivity.

Propagation experiments were conducted in the Cheyenne Mountain area to determine the feasibility of hardened radio communication between NORAD COC (and nearby surface installations). An 800-foot antenna was placed in a drill hole parallel to and 700 feet below the surface of Cheyenne Mountain. Receiving and transmitting measurements were made with this buried antenna. Analyses of the experimental results indicate that the useful frequency range is from 70 Kc to 200 Kc. In this range, estimates have been made for single-channel or multichannel teletype transmission from the COC to distances of a few tens of miles. (Author)

AD-615 799 Div. 25/3, 15/1, 25/5
CFSTI Prices: HC$1.00 MF$0.50

California Univ., La Jolla.
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS,
by W. Kohn and L. J. Sham. 12 May 65, 6p
Technical rept. no. TR-30
Contract NONR221611, Proj. NR017 630

Unclassified report

Descriptors: (*Plasma medium, Quantum mechanics), (*Electrons, Gases), Exchange reactions, Electron transitions, Plasma oscillations, Field theory, Energy, Electrostatics, Ground state, Integral equations, Potential theory.

From a theory of Hohenberg and Kohn, approximation methods for treating an inhomogeneous system of interacting electrons are developed. They lead to self-consistent equations analagous to the Hartree and Hartree-Fock equations, respectively. In these equations the exchange and correlation portions of the chemical potential of a uniform electron gas appear as corrections to the electrostatic potential. (Author)

AD-615 801 Div. 9/4, 20/2, 30/2
CFSTI Prices: HC$3.00 MF$0.75

Naval Ordnance Lab., White Oak, Md.
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS,
by Delbert L. Lehto and Morton Lutzky. Mar 65, 69p NOLTR-62-168
Task NOL181
DASA 1518

Unclassified report

See also UCRL-6919.

Descriptors: (*Nuclear explosions, Programming-(Computers)), (*Hydrodynamics, Programming-(Computers)), (*Programming(Computers), Hydrodynamics), (*Shock waves, Programming(Computers)), One-dimensional flow, Equations of state.

A one-dimensional hydrodynamic finite-difference computer code (WUNDY), which evolved from the M. Wilkins KO-CODE of the University of California Radiation Laboratory, is described and applied to the calculation of the shockwave from a nuclear explosion. FORTRAN IV listings are given. (Author)

AD-615 804 Div. 25/4, 15/1, 25/5
CFSTI Prices: HC$1.00 MF$0.50

TRG, Inc., Melville, N. Y.
THEORETICAL RESEARCH ON LASER OSCILLATION.
Final rept.,
by M. C. Newstein, S. R. Barone, and N. Solimene.
May 65, 21p Rept. no. 160-FR
Contract AF19 604 8817, Proj. 4645, Task 464502
AFCRL 65-270

Unclassified report

Descriptors:(*Lasers, Oscillation), (*Quantum mechanics, Lasers), Resonators, Interferometers, Thermal radiation, Differential equations, Green's function, Field theory, Quantum statistics.

Topics considered in six scientific reports prepared under the contract are: the theory of plane-parallel Fabry-Perot resonators, perturbed Fabry-Perot resonators at small Fresnel numbers, thermal fields and spontaneous emission in open resonators and the quantum theory of optical coherence. Abstracts and summaries of these six reports are presented as well as an account of some preliminary results on a dynamical theory of laser oscillation. (Author)

AD-615 810 Div. 25/2, 25/6
CFSTI Prices: HC$2.00 MF$0.50

Lowell Technological Inst. Research Foundation, Mass.
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
Quarterly rept. no. 7, 1 Nov 64-31 Jan 65,
by Charles R. Mingins, Luther C. Barcus, and Robert W. Perry. 31 Jan 65, 49p Rept. no. 15
Contract DA36 039AMC02239E,
Proj. 1P6 22001A058 01 04

Unclassified report

Descriptors: (*Quartz, Stresses), (*Vibration, Stability), Deformation, Compressive properties, Tensile properties, Frequency, Piezoelectric crystals, Shear stresses, Strain(Mechanics), Quartz resonators.

Reactions of oscillating quartz piezoids to external application of forces and torques are considered. Measurements of frequency deviations under tension made at 90 degrees in AT plates exhibit a linearity with respect to applied force at relatively large loads. Results on overtone modes and at higher fundamental frequencies are discussed. A comparison is made of the extent of higher-amplitude areas on the major surfaces of a piezoid when excited at an overtone frequency and at the fundamental resonance. A trend is reported in the motional parameters as the tensional load is increased. Tensile stress coefficients of frequency for the BT cut are established for circular and for rectangular plates, at 0 degrees and 90 degrees, and for fundamental and overtone excitation. Comparisons are drawn with AT-cut cases. Experiments are reported dealing with a change in surface temperature of a vibrating plate when a substantial load is applied. Preliminary experiments on the effects of producing a torsional stress are described. The equations of motion of the plate including third-order terms were found. (Author)

AD-615 822 Div. 8/6
CFSTI Prices: HC$2.00 MF$0.50

Naval Research Lab., Washington, D. C.
PREDICTION OF FARADAY ROTATION ANGLES AT VHF AND UHF.
Interim rept.,
by John M. Goodman. 28 Apr 65, 43p
Rept. no. NRL-6234
Proj. RF001 02 41 4001
Unclassified report

Descriptors: (*Magneto-optic effect, Radar signals), (*Radar signals, Ionosphere), Mathematical prediction, Wave transmission, Radar reflections, Electron density, Very high frequency, Ultrahigh frequency.

A study of the Faraday effect has been made and some procedures have been outlined for estimating the amount of Faraday rotation imposed upon linearly polarized radar waves in the ionosphere. The study involves the construction of suitable models for the ionosphere and the geomagnetic field. In the estimation analysis, variable scale height Chapman profiles are used to represent the average ionosphere. The magnetic field model is embodied in a rather standard tabular procedure, which makes use of Navy Oceanographic Office charts. The steps were determined which are required to predict an expectation value for the amount of Faraday rotation imposed upon the radar signals reflected from ionospheric and super-ionospheric targets. These steps involve (a) obtaining a magnetic field parameter from the tabular procedure and (b) estimating the electron content below the target. Both steps (a) and (b) require the knowledge of maximum usable frequencies from Bureau of Standards CRPL maps. (Author)

AD-615 837 Div. 25/6, 15/1, 30/2

Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
COMPUTERS IN SOLID MECHANICS: A CASE HISTORY,
by H. B. Keller and E. L. Reiss. 1964, 8p
Contracts AT30 1 1480, Nonr28542
Unclassified report

Pub. in American Mathematical Monthly v72 n2 pt2 p92-8 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Buckling(Mechanics), Digital computers), (*Digital computers, Buckling(Mechanics)), Differential equations, Continuum mechanics, Deformation, Elastic shells, Stresses, Boundary value problems, Iterative methods.

AD-615 849 Div. 25/6

Cornell Univ., Ithaca, N. Y.
THEORY OF THE THERMAL CONDUCTIVITY OF SUPERCONDUCTING ALLOYS WITH PARAMAGNETIC IMPURITIES,
by Vinay Ambegaokar and Allan Griffin. 2 Sep 64, 20p Technical rept. no. TR-3
Contract NONR40138
NYO 2391-2
Unclassified report

Pub. in The Physical Review v137 n4A pA1151-67 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers).
Available as NYO-2391-2 $3.00/$0.75.

Descriptors: (*Superconductors, Thermal conductivity), Theory, Alloys, Impurities, Paramagnetic materials, Equations of state.

The electronic thermal conductivity (K sub 8) of a weakly coupled, isotropic superconductor doped with a small concentration of paramagnetic impurities is computed. The theory of such superconducting alloys has been given by Abrikosov and Gor'kov, and is based on the assumption that the static magnetic impurities are randomly distributed and that their spins are uncorrelated. Starting from a Kubo formula, K sub 8 is calculated by considering the electron-impurity interaction in the ladder approximation. A considerable simplification of the final expression for K sub 8 obtains if the exchange scattering time tau s is much larger than the total scattering time. Numerical calculations have been made of the ratio of the thermal conductivity in the superconducting and normal states as a function of the reduced temperature (T/T sub c identical with t) for different impurity concentrations. Abrikosov and Gor'kov have shown that the energy gap function (omega sub o(T) is quite different from the Gor'kov order parameter delta(T) in such alloys. It is found, however, that K sub 8/K sub n is less than unity even in the 'gapless' region (Delta tau s<1). Moreover, K sub s/K sub n as a function of t decreases with the paramagnetic-impurity concentration for t greater than or approximately equal to 0.8 and low concentrations. Some aspects of the Abrikosov-Gor'kov model are reviewed in an Appendix. The numerical values of delta, wo, and the density of states that were used in the evaluation of K sub s/K sub n are given separately. (Author)

AD-615 850 Div. 25/6

Cornell Univ., Ithaca, N. Y.
CRITICAL MAGNETIC FIELD OF A THIN FILM OF SUPERCONDUCTOR,
by G. Rickayzen. 3 Dec 64, 9p
Technical rept. no. TR-5
Contract NONR40138
Unclassified report

Revision of manuscript submitted 18 Aug 64. Pub. in The Physical Review v138 n1A pA73-8 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductors, Magnetic fields), Superconductivity, Films, Theory, Thickness, Cryogenics, Transition temperature.

A theory of the critical field of a thin superconductive film is given based on the assumption that this is the

field in which the normal state becomes unstable to the formation of Cooper pairs. Only the case where l, the mean free path for the electrons is much less than d, the thickness of the film, and where the coherence length is less than d squared/l is discussed. The resulting field for temperatures near T sub c agrees with that predicted by the Ginzburg-Landau theory. At lower temperatures, the field is greater than that predicted by an earlier theory of Maki and appears to be in better agreement with the experimental results. (Author)

AD-615 864 Div. 25/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE,
by I. V. Dvornikova and I. M. Nagibina. 7 May 65, 19p
FTD-TT-64-1138
TT 65-62388

Unclassified report

Unedited rough draft trans. of Optika i Spektroskopiya (USSR) v4 n4 p421-9 1958.

Descriptors: (*Electric arcs, Electric discharges), (*Electric discharges, Electric arcs), Direct current, Alternating current, Chromium, Manganese, Calcium, USSR, Spectroscopy.

A method determining the degree of heterogeneity of an arc discharge, by the depth of the cave-ins of spontaneously turned multipler lines is described.

AD-615 871 Div. 25/6
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
STUDYING THE BEHAVIOR OF SHELLS AND PLATES UPON IMPACT,
by A. S. Volmir and I. G. Kildibekov. 11 May 65, 10p
FTD-TT-65-443
TT 65-62395

Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavdenii. Mashinostroenie (USSR) n7 p26-30 1964.

Descriptors: (*Structural shells, Impact shock), (*Metal plates, Impact shock), (*Impact shock, Structural parts), Shock(Mechanics), Elasticity, Panels(Structural), Differential equations, Stresses, Mathematical analysis, Deformation, Cylindrical bodies, Equations, Theory.

Compiled are nonlinear dynamic equations of the theory of elasticity of thin shells and plates with consideration of inertia forces, corresponding to displacements in the center surface. To the number of such problems are included, for example, the problem of the behavior of cylindrical shells at longitudinal impact. Introduced is a dynamic function of stresses in the center surface of shell and flat panel. For a shell of arbitrary outline was obtained a system of three equations relative to the function of stresses, bending function, and tangent stress in center surface. Discussed are special cases of a circular cylindrical shell and flat panel. In static variant a system of differential equations is given which changes over into an ordinary system of equations of nonlinear theory of shells. When the nonlinear members are thrown away and in the assumption that initial bending is absent, it is possible to obtain basic equations of dynamic linear theory. (Author)

AD-615 872 Div. 25/6, 13/4
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
STABILITY OF AN ANISOTROPIC CIRCULAR CYLINDRICAL SHELL DURING LONGITUDINAL COMPRESSION, INTERNAL PRESSURE AND IRREGULAR HEATING IN LENGTH,
by V. V. Kabanov. 11 May 65, 14p FTD-TT-65-444
TT 65-62396

Unclassified report

Unedited rough draft trans. of mono Nauchnoe Soveshchanie po Teplovym Napryazheniyam v Elementakh Konstruktsii (no. 4) Kiev. Doklady, 1964 p159-67.

Descriptors: (*Cylindrical bodies, Stability), (*Structural shells, Stability), Compressive properties, Pressure, Heating, Iterative methods, Stresses, Thermal stresses, Reinforcing materials, USSR.

A discussion is given of a linear stability problem of an anisotropic circular cylindrical shell of average length, freely supported by the ends against rigid diaphragms in the central surface of the shell.

AD-615 875 Div. 25/2, 17/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
STRENGTH OF THIN METAL FIBERS.
by V. N. Geminov and I. M. Kopev. 7 May 65, 13p
FTD-TT-65-14
TT 65-62401

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSR. Institut Metallurgii, Moscow. Trudy, n10 p202-8 1962.

Descriptors: (*Fiber metallurgy, Single crystals), (*Metallic crystals, Fiber metallurgy), (*Single crystals, Fiber metallurgy), Deformation, Crystal lattice defects, Stresses, Mathematical analysis, Copper, Mechanical properties, Tensile properties, Fibers.

The report discusses the problems of the strength of thin metallic monocrystals-whiskers.

AD-615 888 Div. 20/1, 25/3
CFSTI Prices: HC$1.00 MF$0.50

Avco-Everett Research Lab., Everett, Mass.
THERMAL ELECTRON IMPACT IONIZATION RATE CALCULATION FOR H, H2, He, N2, 02, N02, Ar, AND Hg,
by G. Sargent Janes. May 63, 13p
Rept. no. AMP-107
Contract AF49 638 659, Proj. 9752, Task 975201

Unclassified report

Descriptors: (*Ionization, Gases), (*Electron bombardment, Ionization), Ionization potentials, Plasma medium, Excitation, Ground state, Hydrogen, Helium, Nitrogen, Oxygen, Argon, Mercury, Ions, Nitrogen compounds, Oxides.

Calculations are given which predict the rate at which ionization will occur in low density H2, H, He, N2, O2, NO2, Ar, and Hg gas due to the impact of thermal electrons. The results are presented as a function of electron temperature. It is assumed that the electrons have a Maxwell-Boltzman energy distribution, and that

all ionization takes place directly from the neutral ground state. The latter is the collision limited case and (with the exception of effects due to metastable states) is approximately satisfied for densities below 10 to the 14th power particles per cc. (Author)

AD-615 889 Div. 25/6, 15/1

Naval Ordnance Test Station, China Lake, Calif.
THEORY OF THE UNSYMMETRIC NUTATION DAMPER,
by A. V. Pratt. 2 Oct 59, 14p
Technical note no. TN-4065-63
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Rotation, Damping), (*Damping, Theory), Nonlinear differential equations, Oscillation, Perturbation theory, Transformations(Mathematics), Euler's angles, Friction.

AD-615 903 Div. 25/3
CFSTI Prices: HC$3.00 MF$0.75

Heat Transfer Lab., Univ. of Minn., Minneapolis.
PERFORMANCE CHARACTERISTICS OF A FULLY DEVELOPED CONSTRICTED TRANSPIRATION-COOLED ARC.
Interim technical rept. for 1 Oct 63-1 May 64,
by E. R. G. Eckert and J. E. Anderson. Apr 65, 61p
Contract AF33 657 7380, Proj. 7063, Task 706303
ARL 65-68 Unclassified report

Descriptors: (*Electric arcs, Cooling), (*Plasma jets, Heating), (*Gas flow, Heating), Enthalpy, Water, Porous materials, Thermodynamics, Transport properties, Specific heat, Thermal conductivity, Electrical conductance, Thermal properties, Theory, Mathematical analysis.

A possible way to increase the peak enthalpy in a gas stream heated by a constricted arc is to make the constrictor wall porous and to inject some of the gas through this wall for cooling. In this paper, the peak enthalpy of such an arc heater is compared with the peak enthalpy obtainable in a heater of identical geometry, but with a water-cooled constrictor wall. The comparison is made on the basis of a model which strongly simplifies the thermodynamic and transport properties of the gas. (Ratio of specific heat to thermal conductivity is constant, electrical conductivity is zero below a certain enthalpy and increases linearly with enthalpy above, radiative power emitted per unit volume is zero below the specific enthalpy and constant above). The model predicts that the peak enthalpy at the center line of the exit cross-section of the transpiration-cooled constrictor can attain values more than an order of magnitude higher than in a water-cooled constrictor. Stability problems, difficulties at the electrodes, transition to turbulence and deviations from the assumed property variations will determine the upper limit of the peak enthalpy obtainable with this arc. These can only be determined by experiments. It is felt, however, that the present analysis indicates strong potentialities of a transpiration-cooled constricted arc. (Author) Presented at the AGARD Specialist's Meeting on 'Arc Heaters and MHD Accelerators for Aerodynamic Purposes,' in Rhode-Saint-Genese, Belgium, 21-23 September, 1964.

AD-615 906 Div. 25/6, 15/1
CFSTI Prices: HC$4.00 MF$1.00

MRD Div., General American Transportation Corp., Niles, Ill.
ANALYSIS OF FREE-FIELD DATA IN A HALF-SPACE UNDER DYNAMIC LOADS.
Final rept. for 15 Oct 62-1 Jan 65.
Apr 65, 116p
Contract AF29 601 5552, Proj. 5710, Task 13 144
WL TR-64-143
Unclassified report

Descriptors: (*Stresses, Mechanical waves), (*Integral equations, Stresses), (*Loading(Mechanics), Surfaces), Elasticity, Viscoelasticity, Attenuation, Green's function, Pressure, Strain(Mechanics), Programming(Computers), Underground structures, Nuclear explosions, Seismic waves, Dynamics.

Exact analytic formulas are developed for obtaining wavefront stress and stress-gradient values in elastic and viscoelastic half-spaces subject to dynamic surface loading. These exact wavefront stress values are used along with the results of a double-precision computer code in the display of stress profiles for the elastic half-space problem. Viscoelastic and elastic attenuation formulas are derived. Attenuation contours are plotted. (Author)

AD-615 915 Div. 20/5
CFSTI Prices: HC$3.00 MF$0.75

Varian Associates, Palo Alto, Calif.
A HIGH CURRENT INVESTIGATION OF A 10 Mev S-BAND ELECTRON LINEAR ACCELERATOR.
Final rept.,
by J. Haimson and N. Pering. Jun 64, 65p
Engineering rept. no. ER-312-1F
Contract DA49 146XZ200, Task 16 004
DASA 1523
Unclassified report

Descriptors: (*Electron accelerators, Linear accelerators), (*Linear accelerators, Electron accelerators), S band, Electron guns, Electron beams, Voltage, Waveguides, Electromagnetic pulses, Energy, Performance-(Engineering), Injection, Microwave equipment.

The investigation reports on a series of experiments performed with a high current source attached to an existing 10-Mev electron linear accelerator operated under steady-state and stored energy conditions. Design and construction details of the source are depicted and the electron beam characteristics are discussed. Achievement of very heavy beam loading of the accelerator waveguide under steady-state conditions without observable pulse shortening effects is discussed together with the demonstration of short pulses of high current when operating in the stored energy regime. A conclusion encourages the development of more advanced injection systems capable of providing shorter pulse lengths and higher currents so that microwave storage systems may be more fully exploited. (Author)

AD-615 930 Div. 25/6
CFSTI Prices: HC$5.00 MF$1.25

Cruft Lab., Harvard Univ., Cambridge, Mass.
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
Interim scientific rept.,
by Frank Sandy. 11 Jan 65, 185p
Scientific rept. no. SR-3
Contract AF19 628 3874, Proj. 5635, Task 563503
AFCRL 65-250
Unclassified report

Descriptors: (*Dielectric properties, Ferroelectric materials), (*Ferroelectric materials, Dielectric properties), Potassium compounds, Sodium compounds, Tartrates.

The real and imaginary parts of the dielectric constant of Rochelle salt have been measured at frequencies from 2.5 Gc/sec to 17.12Gc/sec and at 155 Mc/sec. The measurements were made in the temperature range from 50C to 45C which includes both Curie temperatures. Measurements were made both with and without dc biases. The dielectric constant was found to undergo a relaxation of the Debye type whose relaxation time is proportional to the difference between the low-frequency, clamped, differential dielectric constant and its limiting high-frequency value. It was also found to have a small additional temperature dependence approximately proportional to T(5/4) and to increase slightly with polarization. Mitsui's model for the ferroelectric effect in Rochelle salt has been extended to cover its high-frequency dielectric behavior and has been shown to be consistent with these experimental results. (Author)

AD-615 936 Div. 8/6, 2/7
CFSTI Prices: HC$2.00 MF$1.75

Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES,
by Wilhelm Nupen. 1 Apr 65, 346p
Technical note no. TN-304
Unclassified report

Prepared in cooperation with American Meteorological Society, Washington, D. C.

Descriptors: (*Bibliographies, Radio waves), (*Radio waves, Propagation), (*Troposphere, Propagation), Radiofrequency, Electromagnetic waves.

This bibliography contains over a thousand abstracts or titles taken from the literature published between 1945 and 1964, incl., but the bulk of the literature comes after 1955. The subject matter is confined to the effects of the Earth's atmosphere on radiofrequency radiation from 10 cps to 100,000 Mc.

AD-615 937 Div. 8/6

Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTROMAGNETIC PULSE,
by J. C. Morgenstern and J. R. Johler.
Apr 65, 28p Technical Note no. TN-310
Unclassified report

Rept. prepared in cooperation with Mitre Corp., Bedford, Mass. Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.30, as C-13.46:310.

Descriptors: (*Radio waves, Attenuation), (*Electromagnetic pulses, Propagation), Radiofrequency, Functions, Graphics.

The attenuation of the peak of the ground wave EM pulse is presented as a function of distance. These attenuation functions are compared to combinations of single frequency attenuation functions and simple attenuation functions based on inverse distance raised to integral and non-integral exponents.

AD-615 938 Div. 8/6, 2/7

Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT,
by J. Ralph Johler and Leslie A. Berry.
7 Jun 65, Technical note no. TN-313
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.45, as C-13.46:313.

Descriptors: (*Radio waves, Propagation), (*Gas ionization, Nuclear explosions), Ions, Ionospheric propagation, Ionospheric disturbances, Plasma(Physics), Magnetohydrodynamics, Low frequency.

Natural disturbances and high altitude nuclear detonations produce large quantities of ions in the ionosphere and in the atmosphere. The effect of such ionization on the propagation of LF radio waves is not in general negligible. In fact, physically realizable production rates can be postulated in which the ions rather than the electrons control the propagation of radio waves around the terrestrial sphere. Therefore, considering only an electron gas type plasma as an ionosphere model is subject to possible grave errors in the theoretical prediction of LF propagation. The theoretical solution of the heavy ion problem requires the introduction of an equation of motion or hydrodynamic equation for each gas constituent. (Author)

AD-615 957 Div. 25/4, 8/1, 15/1, 20/1, 25/2, 25/7
CFSTI Prices: HC$1.00 MF$0.50

Emmanuel Coll., Boston Mass. Research Language Center.
ACTA PHYSICA SINICA, VOL. 20, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS,
ed. by Richard M. Holden. Jun 64, 10p
E-TC-Ch-64-23
Contract AF628 3869
TT 65-62406 Unclassified report

Abstract trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n1 p1-96 1964.

Descriptors: (*Physics, Abstracting), China, Waveguides, Electrical impedance, Green's function, Electron guns, Nuclear magnetic resonance, Fluorides, Ions, Crystals, Programming(Computers), Masers, Ruby, Martensite.

Contents:
Relations between coupling coefficients of waveguides with different surface impedances and their application to precision calculation of long-distance waveguides
Three directional expansion of the Green function and delta function
The mass of mu-neutrino
The focusing of a partially shielded multi-electrode electron gun
A study of the chemical distortions of nuclear magnetic resonance of fluoride ions in crystals and solutions
A system of standard programs for the structural analysis of crystals on a 104 computer
The ruby optical maser
Internal friction peaks associated with the coherency of decomposition products of high and low-carbon martensite
The effect of distortions and noises on the measurement of multiple coulomb scattering in nuclear emulsion and its elimination
Application of the multi-terminal network theory to the determination of the boundary values of a power model.

AD-615 960 Div. 25/2, 8/6, 25/4, 25/8
CFSTI Prices: HC$3.00 MF$0.75

Thomas J. Watson Research Center, Yorktown Heights, N. Y.
PHONON INTERACTIONS IN CRYSTALS.

Quarterly progress rept. no. 7, 15 Nov 64-14 Feb 65,
by N. S. Shiren, M. Pomerantz, and R. J. von Gutfeld.
14 Feb 65, 59p
Contract DA36 039AMC02280E, Proj. 1P6 22001A056
Unclassified report

Descriptors: (*Phonons, Crystals), (*Crystals, Phonons), (*Masers, Gain), Acoustic properties, Germanium, Silicon, Impurities, Energy, Velocity, Attenuation, Photons, Cryogenics, Thermal conductivity, Crystal oscillators, Frequency converters, Microwave amplifiers, Electron transitions.

A quantitative theory of adiabatic fast passage in S = 1 systems is presented. This theory supports the qualitative arguments previously given to explain the experimental MASER results. The dynamic gain mechanism is shown to be stimulated phonon - photon double quantum emission. The attenuation of 9 Gc/s phonons in phosphorous doped Ge was measured. According to the proposed theory of attenuation caused by bound electrons in degenerate states, the attenuation of the shear wave in the (100) direction should show a maximum at about 20K. The observed attenuation shows a maximum at about 15K, confirming the theory. The implications of this attenuation mechanism for the thermal conductivity of doped Ge and Si are considered. Many observations on the thermal conductivity are explained by the attenuation in degenerate electronic states. Data are presented on the values of the acoustic energy velocity for quartz, sapphire, Na Cl and KI. The experimental values are those obtained from heat pulse propagation studies and are in good agreement with theoretical energy velocity values. The theoretical energy velocity values were determined by a special geometrical construction given by Musgrave and allow the construction of energy velocity surfaces. Values of the velocity are given that agree to within 5% of the observed heat pulse velocities. The multivalued nature of the energy surface is discussed and shown to be in good agreement with the heat pulse experiments. (Author)

AD-615 968 Div. 26/1, 4/4
CFSTI Prices: HC$4.00 MF$0.75

Air Force Cambridge Research Labs., Bedford, Mass.
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY-BIPHENYL.
Physical sciences research papers,
by Marvin S. Brooks and Willard R. Hancock.
Apr 65, 108p Paper no. PSRP-95, AFCRL 65-231
Proj. 5620, Task 562004
Unclassified report

Descriptors: (*Zone melting, Metalorganic compounds), (*Metalorganic compounds, Zone melting), (*Phase studies, Metalorganic compounds), Eutectics, Distribution, Tracer studies, Antimony, Isotopes, Antimony compounds.

The results of an experimental study of zone refining of the binary system triphenyl antimony-biphenyl are presented. The isotope Sb124, which is a strong gamma emitter, was employed as a tracer; this allowed a rapid in situ nondestructive analysis, closely spaced experimental points, and the opportunity to study distribution as a function of varying experimental conditions. With the aid of computers (IBM 7090 and IBM 7044) apparent (distribution coefficients) were calculated and the experimental data compared with those predicted from various mathematical models. (Author)

AD-615 971 Div. 25/6, 26/1
CFSTI Prices: HC$2.00 MF$0.50

Mallory (P. R.) and Co., Inc., Burlington, Mass.
INVESTIGATION OF ULTRA HIGH VACUUM SPUTTERED THIN FILMS,
by George Wallis and Ernest Pittelli. 30 Apr 65,
33p Scientific rept. no. SR-3
Contract AF19 628 3840, Proj. 4608, Task 460805
AFCRL 65-345
Unclassified report

Descriptors: (*Germanium, Electrical properties), (*Semiconductors, Films), (*Films, Germanium), Vacuum apparatus, Sputtering, Vapor plating, Single crystals, Crystal lattice defects, Sapphires, Scattering, Temperature, Probability, Metallic crystals, Valence.

Minor modifications in the construction of the vacuum chamber and changes in the outgassing schedule were made in order to reduce background pressure during sputtering. Single crystal sapphire and calcium fluoride were added to the substrate materials under investigation. Thick films with improved structural and electrical characteristics were grown. A paper was completed on the electrical characteristics of vacuum deposited germanium films. The paper which is included in the report attempts to account quantitatively for the electrical behavior of the films. (Author)

AD-615 974 Div. 25/2
CFSTI Prices: HC$3.00 MF$0.75

North American Aviation Science Center, Thousand Oaks, Calif.
A FUNDAMENTAL STUDY OF DEFECT-DISLOCATION INTERACTION IN NaCl TYPE LATTICES.
Final rept. for 1 Mar 63-28 Feb 65,
by R. Chang. 28 Feb 65, 68p
Contract Nonr406300, Proj. NR032 479
Unclassified report

Descriptors: (*Crystal lattice defects, Halides), (*Halides, Crystal lattice defects), Sodium compounds, Chlorides, Fluorides, Deformation, Stresses, Crystal lattices, Dipole moments, Strain(Mechanics), Creep, Quenching(Cooling), Heat treatment, Potassium compounds, Calcium, Impurities, Lithium compounds.

Contents:
Effect of divalent metal impurity distribution, quenching rate, and annealing temperature on flow stress in ionic crystals (NaCl, LiF)
The elastic interaction between dislocations and defects associated with calcium impurities in sodium chloride
Perturbation of the V2-band in Ca-doped KC1 from elastic and plastic deformation
Optical probing of the environment of F centers in deformed alkali halides.

AD-615 978 Div. 20/2, 25/5
CFSTI Prices: HC$1.00 MF$0.50

New York Univ., N. Y. Dept. of Physics.
SPIN-EXCHANGE SCATTERING IN UNIFORM MAGNETIC FIELDS,
by A. E. Glassgold. 1965, 7p Technical rept. no. N65-2
Contract Nonr28558, Proj. NRO14 311
Unclassified report

Descriptors: (*Elastic scattering, Atoms), (*Atoms, Spin), Magnetic fields, Quantum mechanics, Matrix algebra, Operators(Mathematics), Polarization.

Spin-exchange scattering with atomic beams is considered for atomic systems having one effective electron.

AD-615 987 Div. 25/3, 8/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
COMPENSATION DEVICE,

by O. P. Khvostov. 7 May 65, 5p FTD-TT-64-1384
TT 65-62413

Unclassified report

Unedited rough draft trans. of Russian patent 160844, pub. 26 Feb 64, appl. 692589/26-3.

Descriptors: (*Interference analyzers, Magnetic coils), (*Magnetometers, Interference analyzers), (*Computers, Magnetometers), Electric currents, Corrections, Patents, USSR.

Object of the invention: A device for compensating constant, inductive and magnetic interferences of eddy currents, which contains auxiliary magnetometers, which is distinguished by the fact, that for the purpose of assuring the possibility of introducing corrections, into any part of the measuring system and also of compensating the interferences, in the circuits of the electrical load in it, there is used a computing device, the input of which is connected with auxiliary magnetometers, with shunts in circuits of electrical charge and with the output of the basic magnetometer, and the output signal is passed to a determined part of the system, for example, into the compensator coil, located on the sensitive element of the basic magnetometer. (Author)

AD-615 990 Div. 25/6, 9/5, 30/5
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
NEWS OF THE ACADEMY OF SCIENCES OF THE USSR. MECHANICS AND MACHINE BUILDING, NO. 1, 1964 (SELECTED ARTICLES),
by I. N. Murzinov and M. Kh. Akhmetzyanov.
5 Apr 65, 20p FTD-TT-64-1088
TT 65-62416

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie n1 p115-20 1964. Available copy will not permit fully legible reproduction.

Descriptors: (*Aerodynamic heating, Hypersonic flight), (*Hypersonic flight, Aerodynamic heating), (*Photoelasticity, Coatings), (*Coatings, Photoelasticity), High altitude, Theory, Velocity, Thermal conductivity, Stresses, Deformation, Determination, Structural shells, Metal plates, Flexible structures, USSR.

Contents:
Similarity of temperature profiles in bodies at free movement in atmosphere at hypersonic velocities at higher altitudes, by I. N. Murzinov
Employment of the photoelastic coatings method to determine stresses and deformations in flexible plates and shells, by M. Kh. Akhmetzyanov.

AD-615 999 Div. 25/6
CFSTI Prices: HC$1.00 MF$0.50

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
SPHERICAL WAVES IN VISCOELASTIC MEDIA,
by T. M. Lee. Apr 65, 19p
Research rept. no. RR-158
Task IV025001A13001

Unclassified report

Descriptors: (*Viscoelasticity, Mechanical waves), (*Spheres, Wave transmission), Solids, Stresses, Numerical analysis, Tensor analysis, Potential theory.

Closed form solutions to the propagation of spherical waves from an internal steady oscillating pressure source as well as to the transient response of a viscoelastic medium to a pressure impulse are presented. The assumption that the loss factors, quantities related to the dissipative property of a viscoelastic medium, are independent of frequency is used here for investigating the wave propagation phenomenon due to the action of an impulse. Numerical examples for the displacement and stress functions have been used to illustrate the damping effect of a viscoelastic medium by comparing with its special case-the elastic medium. It is found that this effect shows its significance with increased traveling distance. Also, in the steady oscillation problems damping is of importance when the vibration frequency is high, while in the transient case it causes the decrease in the peak amplitude and also a time lag in the arrival of the wave front. (Author)

AD-616 002 Div. 25/4, 25/2, 25/6
CFSTI Prices: HC$1.00 MF$0.50

Illinois Univ., Urbana. Engineering Experiment Station.
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
by N. Holonyak, Jr., M. D. Sirkis, C. J. Nuese, and C. M. Wolfe. Mar 65, 18p Scientific rept no. SR-2
Contract AF19 628 4337, Proj. 4608, Task 460805
AFCRL 65-271

Unclassified report

Descriptors: (*Semiconductors, Lasers), (*Crystal growth, Semiconductors), (*Lasers, Semiconductors), Gallium alloys, Arsenic alloys, Phosphides, Single crystals, Electrical properties, Diodes(Semiconductor), Impurities, Luminescene, Electron bombardment, Gallium compounds.

Work is described which indicates major progress has been achieved by extending to binary and ternary III-V compounds, i.e., to GaP and GaAsP, the vapor-liquid-solid (VLS) growth mechanism demonstrated recently in silicon by Wagner and Ellis. This has made possible the growth of dislocation-free III-V compounds and helps elucidate the mechanisms controlling the growth of these complicated materials. Further effort has been expended and progress achieved in the synthesis of laser-quality GaAsP. The effects of doping impurities on growth of single crystal GaAsP are mentioned. The dislocation densities observed are also mentioned. The properties of lasers fabricated to date in this program are tabulated. The behavior of threshold current in a certain crystal as a function of Fabry-Perot reflector spacing is presented. The current state of electron bombardment experiments is outlined. (Author)

AD-616 012 Div. 20/2, 20/3

High Energy Physics Lab., Stanford Univ., Calif.
EXCITATION OF ISOMERIC STATES IN Rh103 AND In115 BY ELECTRONS,
by P. Kruger, T. M. Crawford, J. Goldemberg, and W. C. Barber. 28 Jul 64, 10p Rept. no. HEPL-314
Contract Nonr22567, Proj. NR022 026

Unclassified report

Pub. in Nuclear Physics v62 n4 p584-92 1965
(Copies available only to DDC users).

Descriptors: (*Rhodium, Isomeric transitions), (*Indium, Isomeric transitions), (*Isomeric transitions, Electron bombardment), Nuclear isomers, Excitation, Gamma-ray scattering, Gamma-ray absorption coefficients, Gamma-ray cross sections, Inelastic scattering.

Yields for the production of the 57 m isomeric state of Rh103 and for the 4.5 h state of In115 were measured both for electrons and photons of energies between 7 and 18 MeV. The electrons were produced by the Stanford Mark II Linear Accelerator, and the irradiations were made with

the 'stacked foil' method. The sensitivity of the electron/photon yield ratio to the multipole character of the reaction was used to obtain information on the absorption process of gamma-rays. The results of Rh103 lie somewhat lower than, but approximately parallel to, the theoretical results expected for electric dipole absorption. This type of result has been observed previously where electric dipole absorption is the dominating mechanism. The results for In115, on the contrary, are more than a factor of two higher than expected for dipole absorption, indicating that quadrupole or higher multipole transitions have a dominating role. In the course of the experiment we observed the reaction Rh103 (gamma, 2p)Tc101. The cross section for this reaction is about three orders of magnitude smaller than that for the (gamma, gamma') reaction. (Author)

AD-616 015 Div. 25/3, 25/4

National Research Council of Canada, Ottawa (Ontario). Div. of Pure Physics.
MEASUREMENT OF THE FARADAY EFFECT IN A THETA-PINCH PLASMA USING A He-Ne LASER,
by I. S. Falconer, R. Benesch, and S. A. Ramsden.
30 Nov 64, 3p Rept. no. NRC-8278
Unclassified report

Pub. in Physics Letters v14 n1 p38-40 Jan 1 1965
(Copies available only to DDC users).

Descriptors: (*Magneto-optic effect, Plasma medium), (*Plasma medium, Magneto-optic effect), Magnetic pinch, Helium, Neon, Lasers, Magnetic fields.

A measurement is reported of the Faraday rotation in a theta-pinch plasma, using a He-Ne laser, operating at 6328A, as the light source. This provides a means of measuring the magnetic field within a plasma, without perturbing the plasma.

AD-616 018 Div. 25/6, 13/4

Mitre Corp., Bedford, Mass.
STRESSES AT TUNNEL INTERSECTIONS,
by William F. Riley. 1964, 13p
Contract AF19 628 2390
ESD TDR 63-468
Unclassified report

Pub. in Journal of the Engineering Mechanics Division v90 nEM2 p167-79 Apr 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stresses, Underground structures), (*Underground structures, Stresses), Experimental data, Photoelasticity, Tensile properties, Epoxy plastics, Models(Simulations).

The experimental program described herein was conducted to determine the stress distributions associated with three common types of cylindrical tunnel intersections (tee, cross, and right angle) when they are located in a uniform, uniaxial, stress field. The stresses were determined by using conventional three-dimensional photoelasticity methods. The results of the study indicate that the maximum tensile stresses (circumferential and axial) in the region of the intersections are equal to or slightly less than those which exist in the tunnel away from the intersection. The maximum compressive stresses at the corner of the intersection are approximately 60% greater than the compressive stresses in the tunnel away from the intersection. The high stress region is localized, however, and the maximum circumferential compression decays to the tunnel value within a distance of one diameter of the intersection. The maximum compressive stress on the wall of the tunnel opposite the corner (tee and right angle intersections) is not significantly influenced by the presence of the intersection. (Author)

AD-616 020 Div. 25/2, 25/3, 25/6

Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy.
RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPERCONDUCTING NIOBIUM,
by C. S. Tedmon, Jr., R. M. Rose, and J. Wulff.
30 Aug 64, 7p
Grant DA ARO D31 124G236
AROD 3473:10
Unclassified report

Pub. in Journal of Applied Physics v36 n3 pt1 p829-35 Mar 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Niobium, Superconductivity), (*Crystal structure, Niobium), (*Resistance(Electrical), Niobium), Crystal lattice defects, Crystal substructure, Deformation, Magnetic fields, Electric currents, Single crystals, Superconductors.

Resistive measurements of the critical current density J in transverse magnetic fields were made on single crystals of niobium, which had been subjected to systematic thermal, mechanical, and chemical treatments in order to produce a wide range of substructural densities, and variations in the oxygen content. The introduction of plastic deformation into niobium crystals produced a peak in J at applied magnetic fields of strength H, the upper critical field. The peaks in J were removed by annealing the crystals in the recovery range. The critical current density was increased both below and above H by producing a dislocation substructure in the crystals. Small additions of oxygen also caused J to increase above and below H. The upper critical field, however, was relatively insensitive to structure, varying only through the structure sensitivity of the bulk GLAG parameters. (Author)

AD-616 022 Div. 25/8, 4/4

Institute for the Study of Metals, Univ. of Chicago, Ill.
BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS,
by Brij M. Khorana and D. H. Douglass, Jr.
9 Nov 64, 5p
AROD 4184:4
Unclassified report

Pub. in The Physical Review v138 n1A pA35-9 Apr 5 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Transition temperature, Helium), (*Helium, Liquefied gases), (*Capillary tubes, Transition temperature), Condensation, Gases, Films, Kinetic theory.

The problem of the transition temperature of liquid helium in narrow channels has been considered by using the ideal Bose-Einstein gas as a model. It has been found that for a channel of square cross section (DXD) and length L, the transition temperature T is given by the expression T/T sub B = (0.84)Dsq./LA under the conditions that D sq/L<lambda, where lambda is the thermal de Broglie wavelength, and T sub B is the transition temperature in the case of an infinite volume. (Author)

AD-616 023 Div. 25/7, 20/2

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.

EXPERIMENTAL OBSERVATION OF ELECTRIC-QUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA,
by R. D. Ehrlich, R. J. Powers, V. L. Telegdi, J. A. Bjorkland, and S. Raboy. 18 Sep 64, 4p
Unclassified report

Pub. in Physical Review Letters v13 n18 p550-3 Nov 2 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hyperfine structure, X-ray spectrum), (*Muons, Hyperfine structure), (*X-ray spectrum, Hyperfine structure), Meson reactions, Nuclear magnetic moments, Nuclear spectroscopy, Quadrupole moments, Nuclear moments.

AD-616 032 Div. 25/8, 4/4, 15/2

Northwestern Univ., Evanston, Ill. Technological Inst.
KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES,
by S. Harris and M. B. Lewis. 21 Sep 64, 9p
Unclassified report

Pub. in Physical Review v137 n5A pA1392-400 Mar 1 1965(Copies not available to DDC or Clearinghouse customers)
Supported by ONR.

Descriptors: (*Kinetic theory, Gases), (*Partial differential equations, Kinetic theory), Statistical functions, Statistical mechanics, Force(Mechanics), Density, Time, Series, Operators(Mathematics).

The kinetic equation for a dilute gas with short-range forces is derived by a method which we believe to be physically more transparent than other methods. We first derive a density expansion for the correlation functions, the coefficients of which are functionals of F, the first distribution function. These functionals relax to time-independent functionals over a time interval t (which we argue to be of the order of the duration of a collision) after a time t sub o (which is characterized by the phases) from the initial time. The functionals contain F over the interval + and therefore the resulting kinetic equation is non-Markoffian. The non-Markoffian behavior is removed by further expanding the correlation functions in a parameter that is the ratio of the duration of a collision to the mean free time. The results for the correlation functions are carried to first order and agree with those of other methods for configurations where the particles are interacting, and therefore lead to the same kinetic equation, but are otherwise different. (Author)

AD-616 033 Div. 25/2, 4/4

Iowa State Univ., Iowa City. Dept. of Chemistry.
THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
Revised ed.,
by N. C. Baenziger, R. C. Medrud, and J. R. Doyle.
1 May 64, 6p
Grants DA ARO D31 124G26, NSF G6085
AROD 3072:4
Unclassified report

Pub. in Acta Crystallographica v18 pt 2 p237-42 Feb 1965 (Copies available only to DDC users)
Revision of manuscript dated 23 Dec 63.

Descriptors: (*Halogenated hydrocarbons, Crystal structure), (*Crystal structure, Halogenated hydrocarbons), Akenes, Platinum compounds, Chlorine compounds, Metalorganic compounds, Single crystals, Chlorides.

The crystal structure of dipentene platinum (II) chloride was determined by single-crystal methods. The orthorhombic unit cell, a = 10.188, b = 7.992, c = 14.401 A, space group P2(1)cn, contains four monomeric molecules. The coordination about Pt is planar square with the two Cl atoms occupying cis positions. The two double bonds of the olefin occupy the remaining two coordination positions. The two planes defined by the two double bonds and their attached atoms are oriented perpendicularly to the Pt-Cl plane and to the Pt dsp squared orbitals. The axis of one of the double bonds is perpendicular to the Pt-Cl plane, but the other one is tilted to make a 62 degree angle with the plane. (Author)

AD-616 036 Div. 25/2, 30/5

Illinois Univ., Urbana.
X-RAY GENERATION OF COLOR CENTERS IN ZONE-REFINED KCl AND KBr,
by T. M. Srinivasan and W. D. Compton. 3 Aug 64, 11p
Contract AF49 638 529, Proj. 9763, Task 976301
AFOSR 65-0767
Unclassified report

Pub. in Physical Review v137 n1A pA264-72 Jan 4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Potassium compounds, Color centers), (*Zone melting, Potassium compounds), (*Halides, Potassium compounds), Crystals, Chlorides, Bromides, Impurities, Purification, Temperature, Cryogenics, X-rays, Optical properties, Crystal lattice defects.

The techniques of zone purification of KCl and KBr crystals are described, and the success of this technique in removing impurities such as hydroxyl ions and divalent cations is demonstrated. A comparison of the defects introduced into zone-purified salts and commercial salts by x irradiation at room temperature and at liquid-helium temperature is given. Studies of the optical bleaching of F, H and V sub K centers by F-band light at liquid-helium temperature gives evidence of the spatial proximity of these centers. (Author)

AD-616 038 Div. 25/3, 25/6

Technion - Israel Inst. of Tech., Haifa.
MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES,
by A. A. Hirsch. 24 Feb 64, 12p
Contract AF61 052 481, Proj. 9763, Task 976302
AFOSR 65-0765
Unclassified report

Pub. in Physica v30 p1545-56 1964 (Copies available only to DDC users).

Descriptors: (*Nickel, Magnetic properties), (*Resistance-(Electrical), Nickel), (*Magnetic properties, Cryogenics), Deformation, Hysteresis, Tensor analysis, Magnetic fields, Anisotropy.

A phenomenological analysis is outlined for the magnetoresistance effect in plastically deformed pure nickel below magnetization saturation down to liquid helium temperatures, which is based on the assumption of time dependent hysteresis phenomena. Both preferred orientation and induced uniaxial magnetic anisotropy are expected to be created by the plastic flow, when the deformation of the polycrystalline material is carried out by cold rolling with high reduction in the thickness of the sample. The magnetoresistance hysteresis loops can be ascribed to a magnetization process,

which can be discussed from the viewpoint of a domain structure, in which a rotational process of reorientation of spins predominates. The field interval corresponding to nonsaturated states of magnetization is higher than expected in ordinary bulk material, where no orientation and size effects are of importance for the magnetization reversal. The dynamic magnetoresistance loops performed at constant drive amplitude of the applied magnetic field, when a triangular waveform and low frequencies are used, are different from the static loops which can be described when taking into consideration the tensor of the electrical resistivity in a cubic ferromagnetic crystal. These deviations become appreciable at liquid helium temperatures, and as suggested in this analysis, they may be related to a mechanism of magnetization reversal having a relatively long switching time. (Author)

AD-616 039 Div. 25/8

Mellon Inst., Pittsburgh, Pa.
THERMODYNAMICS OF MATERIALS WITH MEMORY,
by Bernard D. Coleman. 25 Apr 64, 47p
Contract AF49 638 541
AFOSR 65-0368
Unclassified report

Pub. in Archive for Rational Mechanics and Analysis v17 n1 p1-46 1964 (Copies available only to DDC users).

Descriptors: (*Thermodynamics, Materials), Continuum mechanics, Deformation, Temperature, Stresses, Strain(Mechanics), Momentum, Energy, Entropy, Field theory, Tensor analysis, Inequalities.

AD-616 042 Div. 25/3, 25/5

National Magnet Lab., Mass. Inst. of Tech., Cambridge.
QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD,
by Norman J. Horing. 28 Jan 64, 63p
Contract AF19 604 7344
AFOSR 65-0730
Unclassified report

Pub. in Annals of Physics v31 n1 p1-63 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Plasma oscillations, Quantum mechanics), (*Quantum mechanics, Plasma oscillations), (*Green's function, Plasma oscillations), Electrons, Gases, Magnetic fields, Field theory, Damping, Power series, Resonance.

The response function (inverse dielectric function) for an electron gas in an external magnetic field is investigated by the method of Green's functions using the random phase approximation. The spectrum of plasma oscillations, and associated damping, are obtained.

AD-616 043 Div. 25/3, 4/4, 25/2

Lincoln Lab., Mass. Inst. of Tech., Lexington.
SPIN QUENCHING IN THE SYSTEM MnAs(1-x) P(x) AND MnAs(1-y)Sb(y),
by J. B. Goodenough, D. H. Ridgley, and W. E. Newman. 1964, 4p Rept. no. MS-1014
Contract AF19 628 500
Unclassified report

Pub. in Oxides and Compounds II p452-5
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spin, Quenching(Inhibition)), (*Manganese alloys, Arsenic alloys), (*Magnetic properties, Manganese alloys), Phosphorus alloys, Antimony alloys, Crystallography, Mettallic crystals, Atomic orbitals, Atomic energy levels, Exchange reactions, Molecular structure, Chemical bonds.

The peculiar magnetic and crystallographic properties of MnAs are interpreted with a model based on the following assumptions: (i) The Fermi level falls between empty and full broad bands, (ii) covalent mixing broadens the cation d orbitals of e sub g symmetry into a narrow band of collective-electron states, (iii) cation-cation ineractions broaden the c sub h-axis-directed d orbitals into a narrow, cation-sub-lattice d band, (iv) exchange interactions via collective electrons have the same sign as those via localized electrons, given the same number of electrons per orbital, (v) the intra-atomic exchange splitting is equal to the ligand-field splitting over a finite temperature interval, so that spin increases with temperature (dS/dT>0 occurs) through this interval, where narrow bands of a and b spin overlap. The basic features of the model have been confirmed by comparing crystallographic and magnetic data of the systems MnP-MnAs-MnSb with several definite predictions that follow from it. (Author)

AD-616 044 Div. 25/6, 25/2, 25/7

National Magnet Lab., Mass. Inst. of Tech., Cambridge.
UMKLAPP CONTRIBUTION TO BULK ABSORPTION IN SUPERCONDUCTORS,
by Ernest E. H. Shin. 26 Jun 64, 4p
Contract AF19 604 7344
AFOSR 65-0735 Unclassified report

Pub. in The Physical Review v136 n4A pA889-92 Nov 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductors, Absorption spectrum), Absorption, Phonons, Lead, Anisotropy, Single crystals, Polarization, Crystal lattices.

The second-order umklapp contribution to the bulk absorption of radiation is calculated for super-conductors at very low temperatures and is compared with the previously calculated normal phonon contributions. The umklapp absorption spectrum exhibits a sharp peak at the frequency representing the super-conducting energy gap. For Pb, it is not only larger than the normal phonon absorption by many orders of magnitude but is also comparable with the skin absorption. It can also exhibit anisotropy in a single crystal through the polarization factor which appears in the expression for the umklapp absorption rate. (Author)

AD-616 047 Div. 20/2, 15/1

Palmer Physical Lab., Princeton Univ., N. J.
IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS,
by K. Johnson and S. B. Treiman. 4 Jan 65, 6p
Contract AF49 638 1333, Proj. 9751, Task 975101
AFOSR 65-0838
Unclassified report

Pub. in Physical Review Letters v14 n6 p189-91 Feb 8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson scattering, Baryons), (*Meson cross sections, Operators(Mathematics)), (*Operators-(Mathematics), Meson cross sections), Field theory, Relativity theory, Elastic scattering, K mesons, Pions.

It is of value to apply SU(6) notions to questions

involving scattering reactions among particles, which entails coming to grips with the meaning of SU(6) in a relativistic context. In this note the forward elastic scattering of psuedoscalar mesons on baryons is considered. The implication is explored of assigning to the full meson fields the definite SU(6) transformation properties of the meson states themselves. Because of the mass difference between K and pi mesons, attention is restricted to the high energy region. (Author)

AD-616 049 Div. 14/2, 25/2

Yale Univ., New Haven, Conn.
ENERGY OF GRAIN BOUNDARIES IN HALITE.
Revised ed.,
by Roger L. Moment and Robert B. Gordon. 18 May 64, 6p
Contract AF49 638 786, Proj. 9763, Task 976302
AFOSR 65-0769
Unclassified report

Pub. in Journal of the American Ceramic Society v47 n11 p570-3 Nov 1964 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 13 Dec 63.

Descriptors: (*Rock salt, Grain boundaries), Sodium compounds, Chlorides, Crystals, Energy, Torque.

Relative grain boundary energy measurements were made by the tricrystal method for (100) tilt boundaries in NaCl. The dependence of boundary energy on grain misorientation was similar to that in metals; however, the presence of significant torque term effects, i.e. dependence of the boundary energy on boundary orientation, is indicated. A method of measuring the relative magnitudes of the torque terms by applying a driving force to boundaries in bicrystals is described. (Author)

AD-616 050 Div. 20/1, 25/3

Imperial Coll. of Science and Tech., London (England).
ELECTROMAGNETIC AND WEAK INTERACTIONS,
by A. Salam and J. C. Ward. 24 Sep 64, 5p
Grant AF AFOSR46 64, Proj. 9751, Task 975101
AFOSR 65-0825
Unclassified report

Pub. in Physics Letters v13 n2 p168-71 Nov 15 1964 (Copies available only to DDC users).

Descriptors: (*Elementary particles, Electromagnetism), Leptons, Bosons, Nuclear forces, Vector analysis.

In this note a synthesis is attempted between electromagnetism and weak interactions. No explanation is offered for the large boson mass value which results from one of the major differences between the two- that electromagnetic coupling strength is vastly different from the weak. Rather a synthesis is sought in terms of a group structure such that the remaining differences- contrasting space-time behavior and contrasting delta S and delta I behaviors-appear as aspects of the same fundamental symmetry. Both leptons and hadrons are tested. (Author)

AD-616 051 Div. 20/1, 15/1

Imperial Coll. of Science and Tech., London (England).
SU(6) AND CHARGE FORM FACTORS,
by J. M. Charap and P. T. Matthews. 9 Nov 64, 2p
Grant AF EOAR62 87
AFOSR 65-0828 Unclassified report

Pub. in Physics Letters v13 n4 p346-7 Dec 15 1964 (Copies available only to DDC users).

Descriptors: (*Charged particles, Operators(Mathematics)), Baryons, Spin, Bosons, Elementary particles, Nuclear properties.

AD-616 052 Div. 25/2, 25/7

California Univ., La Jolla.
EFFECT OF UNIAXIAL STRESSES ON THE PARAMAGNETIC SPECTRA OF Mn(3+) AND Fe(3+) in MgO,
by Elsa Rosenvasser Feher. 4 May 64, 13p
Grant AF AFOSR631 64
AFOSR 65-0793
Unclassified report

Pub. in Physical Review v136 n1A pA145-57 Oct 5 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Paramagnetic materials, Ions), (*Ions, Crystal lattices), (*Crystal lattices, Deformation), (*Stresses, Paramagnetic materials), Manganese, Iron, Electric fields, Pressure, Electron transitions, Symmetry(Crystallography), Magnesium compounds, Oxides, Molecular spectroscopy, Spin, Hamiltonian.

We have investigated the lowest energy levels of the paramagnetic ions Mn(2+) and Fe(3+) in the host crystal MgO, as a function of externally applied uniaxial stress. The effect of the stress on the energy levels of the paramagnetic ion can be described by introducing into the spin Hamiltonian an additional term of the form S.D.S. When the components of D are expressed as linear functions of the applied stress components, there are only two independent constants of proportionality in our simple case of a cubic crystalline lattice. We have experimentally determined these two constants, i.e., spin-lattice coefficients C(11) and C(44), for Mn(2+) and Fe(3+) in MgO, and find them to be, in units of 10 to the -13th power cm/dyne: for Mn(2+), C(11) = (+7.1±3)% and C(44) = (2.1 ±3)%; for Fe(3+), C(11) = (+26±3)% and C(44) = (5.5±5)%. We have also investigated the absolute value and the angular dependence of the linewidth of the fine structure of Mn(3+) and Fe(3+) in MgO. We can account for these widths in terms of the spin-lattice coefficients, by assuming a random distribution of internal stresses in the host sample. We also indicate the relevance of the spin-lattice coefficients in the determination of the direct spin-lattice relaxation times. (Author)

AD-616 053 Div. 25/2, 17/2

California Univ., La Jolla.
ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUM-GOLD (Uber die Kristallstrukturen der Goldreichsten Phasen in den Systemen Kalium-Gold und Rubidium-Gold),
by C. J. Raub and V. B. Compton. 10 Dec 63, 9p
Grant AF AFOSR631 64
AFOSR 65-0792
Unclassified report

Text in German; Summary in English.
Pub. in Zeitshrift fuer Anorganische und Allgemeine Chemie v332 n1-2 p5-11 1964 (Copies available only to DDC users).

Descriptors: (*Crystal structure, Gold alloys), (*Gold alloys, Crystal structure), Crystal lattices, Gallium alloys, Rubidium compounds, Intermetallic compounds.

The crystal structure of the compounds KAu5 and RbAu5 were determined. Both compounds have the hexagonal CaCu5 type structure, space group D1 - P6/mmm with one formula weight in the unit cell. The lattice constants 6h

for KAu5 are a = 5.659 A, c=4.483 A and for RbAu5 a = 5,760 A, c = 4.448 A. Contrary to former statements the formulae of these compounds are KAu5 and RbAu5 and not KAu4 and RbAu4. (Author)

AD-616 055 Div. 25/6

California Univ., La Jolla.
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
by C. J. Raub, A. R. Sweedler, M. A. Jenson, S. Broadston, and B. T. Matthias. 1 Dec 64, 2p
Grant AF AFOSR631 64, Proj. 9763, Task 976302
AFOSR 65-0791
Unclassified report

Pub. in Physical Review Letters v13 n25 p746-7 Dec 21 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sodium compounds, Tungstates), (*Tungstates, Superconductivity), (*Superconductors, Tungstates), Polymers, Transition temperature, Spectroscopy, Hall effect, Crystals.

The superconductivity was determined for sodium tungsten bronzes having a general formula Na sub x WO3 with 0.1 < x < or = 1. The transition temperatures are in the range below 1K. (Author)

AD-616 056 Div. 20/1

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
BINDING ENERGIES OF HYPERNUCLEI WITH MASS NUMBER A>5,
by N. Crayton, D. H. Davis, R. Levi-Setti, R. G. Ammar, and L. Choy. 18 Aug 62, 11p
Grant AF AFOSR62 358, Proj. 9751, Task 975101
AFOSR 65-0810
Unclassified report

Research done in cooperation with Northwestern Univ., Evanston, Ill.
Rept. presented at the 1962 International Conference on High-Energy Physics at CERN, Geneva, Switzerland.
Pub. in Il Nuovo Cimento v27 (ser. 10) p1078-86 Mar 1 1963 (Copies available only to DDC users).

Descriptors: (*Nuclear binding energy, Pions), Nuclei, Nuclear particles, Mass number, Decay schemes.

Further results are presented on the binding energies of hypernuclei of mass number A > 5. The data from 56 negative pion decays of such hypernuclei are combined with the previously existing data. Problems in the identification of the heavier hypernuclei are critically discussed. The possible existence of an isomeric state of 7He lambda as suggested by Pniewski and Danysz is considered. (Author)

AD-616 057 Div. 25/5, 20/1

Maryland Univ., College Park.
VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
by H. J. Lipkin, N. Meshkov, and A. J. Glick. 18 Feb 64, 12p
Grant AF AFOSR62 46
AFOSR 65-0775
Unclassified report

Research done in cooperation with Weizmann Inst. of Science, Rehovoth, Israel.
Pub. in Nuclear Physics v62 p188-98 1965 (Copies available only to DDC users).

Descriptors: (*N-body problem, Perturbation theory), (*Perturbation theory, N-body problem), Fermions, Hamiltonian, Groups(Mathematics), Operators-(Mathematics), Model theory, Quantum mechanics.

In order to test the validity of various techniques and formalisms developed for treating many-particle systems, a model is constructed which is simple enough to be solved exactly in some cases, but yet is non-trivial. The construction of such models is based on the observation that bilinear products of creation and annihilation operators can be considered as generators of Lie groups. Thus the problem of finding eigenvalues can be greatly simplified by the additional integrals of the motion which are present if the Hamiltonian is constructed so as to commute with invariants of the group. In the present case, the model consists of N fermions distributed in two N-fold degenerate levels and interacting via a monopole-monopole force. It is shown that the model Hamiltonian is easily expressed in terms of quasi-spin operators and exact eigenvalues are obtained. In addition, eigenvalues are calculated with ordinary perturbation theory using values for the number of particles and interaction strength which are appropriate to the more realistic problems of finite nuclei. (Author)

AD-616 058 Div. 25/2, 25/6

Michigan State Univ., East Lansing.
LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTITUTIONAL MASS DEFECTS IN SODIUM IODIDE,
by S. S. Jaswal. 3 Aug 64, 2p
Grant AF AFOSR62 37, Proj. 9763, Task 976301
AFOSR 65-0779
Unclassified report

Pub. in Physical Review v137 n1A pA302-3 Jan 4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Crystal lattice defects, Frequency), (*Crystal lattices, Vibration), (*Sodium compounds, Iodides), Dipole moments, Impurities, Optics, Acoustics.

Frequencies for local modes due to mass defects in NaI are computed on the deformation-dipole model for the perfect lattice. In this crystal local modes occur within the gap between the optical and acoustic branches of the frequency spectrum, as well as above the optical branches. Frequencies are computed for impurity ions of both signs, and of masses both greater and less than that of the host ions. (Author)

AD-616 059 Div. 25/5, 20/2

Imperial Coll. of Science and Tech., London (England).
GAUGE THEORY OF ELEMENTARY INTERACTIONS,
by Abdus Salam and J. C. Ward. 18 Jun 64, 6p
Grant AF EOAR62 87
AFOSR 65-0809
Unclassified report

Pub. in Physical Review v136 n3B pB763-8 Nov 9 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elementary particles, Theory), Baryons, Mesons, Parity, Quantum statistics, Invariance.

F and D couplings of baryons and mesons are shown to arise naturally with a simple extension of the gauge

formalism to a (SU3xSU3)-Lx (SU3xSU3)-R group structure. In its general formulation the theory needs parity doublets of (0+) and (0-) ninefolds. It admits of (two types of F and D coupled) (1+) and (1-) vector and axial-vector meson multiplets, a specially attractive combination of currents which emerges from the formalism being an equal mixture of vector F with axial-vector D (the case of (SU3)-Lx(SU3)-R). The theory also admits an approximate (Bronzan-Low) type of quantum number. (Author)

AD-616 060 Div. 25/1

Defense Research Lab., Univ. of Texas, Austin.
ACOUSTIC WAVE MOTION ALONG A PERIODIC SURFACE,
by M. K. Miller. 3 Aug 64, 7p
Acoustical rept. no. 243
Contract Nobsr72627
Unclassified report

Pub. in Journal of the Acoustical Society of America v36 n11 p2143-8Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sound, Surfaces), Cylindrical bodies, Waveguides, Analysis, Theory.

An analysis is made of a surface wave traveling axially along the boundary of an infinitely long cylindrical surface that has small periodic variations superimposed upon it. By the application of Floquet's theorem, the acoustic pressure is expressed in terms of an infinite series. For waveguides that have acoustic reactances that are periodic with period L in the axial direction, an infinite system of equations is obtained. Unknown amplitude coefficients are determined by a method of infinite determinants. After the amplitude coefficients are known in terms of one coefficient, the phase variation for the surface wave along the cylindrical axis is calculated by phi (z) = arctan Imp/Rep, where Imp and Rep are respectively the imaginary and real parts of P (a,z), a being the radius of the cylindrical surface and z one of the cylindrical coordinates.

AD-616 061 Div. 25/2, 30/5

Madrid Univ. (Spain).
A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION (Estudio Topografico de las Imperfecciones de un Cristal por Difraccion de Rayos X; Metodo del Haz Paralelo),
by J. L. Amoros and P. Tavira. 1964, 7p
Grant AF EOAR62 92, Proj. 9761, Task 976103
AFOSR 65-0743
Unclassified report

Text in Spanish; Abstract in English.
Pub. in Revista de Ciencia Aplicada n98 p217-22 May-Jun 1964 (Copies available only to DDC users).

Descriptors: (*Crystal lattice defects, X-ray diffraction analysis), (*X-ray diffraction analysis, Crystal lattice defects), Crystal structure, X-ray diffraction cameras, Thermal stresses, Spain.

The theoretical background of the parallel beam method is discussed. The intensity of the diffracted beam is proportional to absolute value of F(h) or absolute value squared of F(h)2 according to the dynamical or geometrical theory, respectively. The dynamical theory holds for a perfect crystal and the geometrical theory for a mosaic crystal. If absolute value of F(h) is high for a given crystal plane, the difference between both intensities becomes remarkable and the situation can be used for studying the topography of the perfection of a crystal. A camera following Barth ideas has been built and the experimental results discussed. The new camera allows the observation of the topography of the perfection of a crystal under thermal strain enhancing the potentiality of the method. The camera can also be used in transmission technique where use is made of the anomalous absorption of x-rays by perfect crystals. (Author)

AD-616 068 Div. 25/2, 17/7

Rutgers - The State Univ., New Brunswick, N. J. Coll. of Engineering.
CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
by K. Nakajima, J. J. Slade, and S. Weissmann.
14 Sep 64, 17p
Grant DA ARO D31 124G300
AROD 3560:6
Unclassified report

Pub. in Transactions of the ASM, Quarterly v58 n1 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Copper alloys, Crystal lattice defects), Heat treatment, Energy, Aluminum alloys, Germanium alloys, Stresses, Strain(Mechanics), Electron microscopy, X-ray diffraction analysis.

The low-temperature annealing of quenched copper-aluminum and copper-germanium alloys with low stacking-fault energy, gamma was studied by a novel combination method. This method consists of transmission electron microscopy supplemented by the x-ray divergent beam technique. With the aid of the latter method, a complete quantitative stress-strain analysis was carried out for every annealing stage. It could be shown that short low-temperature annealing resulted in an increase of gamma. This increase was accompanied by: (a) a recombination of partial dislocations into perfect dislocations; (b) a decrease in stored elastic energy; and (c) a directional alignment of single and dipole dislocations. Prolonged annealing led to cluster formation of solute atoms to the sites of perfect dislocations. This cluster formation was accompanied by: (a) a rise in stored elastic energy; (b) a transformation from a directional strain configuration to one more nearly spherical. The solute concentration of the clusters at the dislocation sites was estimated. The observed increase of gamma upon low-temperature annealing appears to be linked to the tendency of solute atoms to form at dislocation sites domains of short-range order. (Author)

AD-616 076 Div. 25/3, 24/2, 30/5

California Univ., Berkeley.
THE VELOCITY OF STREAMER TIPS IN IMPULSE POINT-TO-PLANE CORONA IN AIR, USING LICHTENBERG FIGURE TECHNIQUES,
by Gunter Waidmann. 24 Feb 64, 10p
Technical rept. no. TR-95
Contract Nonr22244, Proj. NR012 201
Unclassified report

Pub. in Zeitschrift fur Physik v179 p102-10 1964 (Copies available only to DDC users).

Descriptors: (*Electrical corona, Configuration), (*Photographic analysis, Electrical corona), Velocity, Electric discharges, Sparks, Avalanche diodes, Glow discharges, Gas discharges.

Positive and negative streamer lengths were measured in point-to-plane impulse corona in air at atmospheric pressure using Lichtenberg figure technique. Applying short time pulses from 9 to 40 nsec duration time-distance plots were obtained, which allowed one to deter-

mine the streamer tip velocity. For a 4 cm gap, a 1 mm diameter point, and a 30 kV pulse an average tip velocity of 1.8X10 to the 8th power cm/sec was found. Comparing these data with HUDSON'S photomultiplier measurement, we may identify the Lichtenberg figure with the 'primary' streamer of HUDSON. The negative streamer tip velocity in the cathode part of the gap was approximately an order of magnitude smaller than the positive streamer velocity. (Author)

AD-616 077 Div. 25/3, 24/2, 30/5

California Univ., Berkeley.
THE LIFETIME OF POSITIVE STREAMERS IN A PULSED POINT-TO-PLANE GAP IN ATMOSPHERIC AIR,
by G. A. Dawson. 2 Nov 64, 13p
Technical rept. no. TR-97
Contract Nonr22244, Proj. NR012 201
Unclassified report

Pub. in Zeitschrift fur Physik v183 p172-83 1965 (Copies available only to DDC users).

Descriptors: (*Electrical corona, Propagation), Electric discharges, Sparks, Avalanche diodes, Gas discharges, Glow discharges, Photomultipliers, Photographic analysis, Voltage.

A determination has been made of the lifetime of positive streamers produced in atmospheric air in a positive point-to-plane gap to which was applied a 40 nsec, 40 kV voltage pulse. The streamer tips have been detected at a given plane in the gap by means of a photomultiplier and high speed oscilloscope. It was found that the streamer tips continued to propagate in the gap, long (up to 35 nsec) after the voltage pulse was removed, in accordance with the predictions of a recently presented model of streamer propagation. Association of this long lifetime with the properties of an isolated tip was made possible by the detection of a new phenomenon at the anode. At the end of the voltage pulse a second luminosity was observed to leave the anode and to extend along the paths of the primary streamers for about one third of their length. This is shown to be the maximum extent of a more highly conducting trunk, behind and separated from the streamer tip, affecting both the propagation of the tip and the eventual transition of a streamer to a breakdown spark. (Author)

AD-616 078 Div. 25/3, 30/5

California Univ., Berkeley.
A MODEL FOR STREAMER PROPAGATION,
by G. A. Dawson and W. P. Winn. 2 Nov 64, 13p
Technical rept. no. TR-96
Contract Nonr22244, Proj. NR012 201
Unclassified report

Pub. in Zeitschrift fur Physik v183 p159-71 1965 (Copies available only to DDC users).

Descriptors: (*Electrical corona, Propagation), (*Mathematical models, Electrical corona), Electric discharges, Sparks, Avalanche diodes, Gas discharges, Glow discharges, Voltage, Velocity, Attenuation, Pressure.

A model is presented to describe the propagation of positive corona streamers in the low field region of a non-uniform field gap in atmospheric air. It has been assumed that the growth is a property solely of the streamer tip, uninfluenced by the channel conductivity. Calculations from the model indicate that the criterion for propagation of a streamer in zero external field is that the number of ions in the tip be 10 to the 8th power and the radius about 0.003 cm. It is proposed that the streamer ceases to propagate as a result of the loss of energy of the tip due to the formation of ion pairs in the channel. The results of previous experimental observations of streamer are compared with calculations derived from the model, and a prediction from the model of the lifetime of streameers after voltage removal is discussed. (Author)

AD-616 079 Div. 20/2

California Univ., Los Angeles.
ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES,
by T. Sawada, M. A. Melkanoff, and D. S. Saxon.
1964, 3p
Unclassified report

Research supported in part by the National Science Foundation and Office of Naval Research, Washington, D. C.
Pub. in Comptes Rendus du Congres International de Physique Nucleaire v2 p868-9 1964 (Copies available only to DDC users).

Descriptors: (*Deuterons, Elastic scattering), (*Elastic scattering, Deuterons), Nuclei, Carbon, Nucleons, Deuteron reactions, Differential cross section.

AD-616 080 Div. 20/2

California Univ., Los Angeles.
EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS,
by M. A. Melkanoff, D. S. Saxon, T. Sawada, and J. S. Nodvik. 1964, 3p
Unclassified report

Research done in cooperation with University of Southern California, Los Angeles.
Supported in part by National Science Foundation, Atomic Energy Commission, and Office of Naval Research, Washington, D. C.
Pub. in Comptes Rendus du Congres International de Physique Nucleaire v2 p870-1 1964 (Copies available only to DDC users).

Descriptors: (*Differential cross section, Nucler models), (*Nuclear models, Differential cross section), Nuclear reactions, Proton scattering, Elastic scattering, Potential scattering.

AD-616 082 Div. 25/2, 25/7

Cornell Univ., Ithaca, N. Y.
LIFETIME OF THE EXCITED I(-) CENTER IN KC1,
by Herbert Mahr and Steven W. Duckett. 9 Nov 64,
7p Technical rept. no. TR-2
Contract Nonr 40147
Unclassified report

Pub. in Physical Review v138 n1A pA276-81 Apr 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Color centers, Excitation), (*Iodine, Ions), (*Excitation, Iodine), Potassium compounds, Chlorides, Single crystals, Electron transitions, Absorption spectrum, Ultraviolet radiation.

The lifetimes of two excited states of iodine centers in KC1 single crystals were measured between 15 and 300K, following flash excitation. Previous and new results of the fluorescent yield of these same emission processes

are presented for comparison. At low temperatures the radiative lifetime is 0.00017 sec and the yield 100%±50% for the blue-green emission process; for the ultraviolet emission the lifetime is 1.3X10 to the -7th power sec and the maximum yield 70%±35%. In an intermediate temperature range, the radiative lifetime starts to decrease whereas the yield stays constant. At still higher temperatures, the lifetime and the fluorescent yield both decrease rather sharply. (Author)

AD-616 083 Div. 9/1, 4/1

Delaware Univ., Newark.
CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH APPLICATION TO RAPID EXTERNAL FLOWS.
Technical rept.,
by J. L. White and A. B. Metzner. 1965, 9p
Contract Nonr228503, Proj. NR062 294
Unclassified report

Pub. in A.I.Ch.E Journal v11 n2 p324-30 Mar 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Fluids, Viscoelasticity), (*Viscoelasticity, Fluids), Laminar flow, Numerical analysis, Differential equations, Perturbation theory, Polymers, Deformation.

A major problem in the analysis of complex flows of viscoelastic fluids lies in the development of a suitable constitutive equation relating stresses to the kinematics of deformation. In this paper an equation is developed from successive approximations to a very general theory of viscoelasticity. This equation, which predicts both a non-Newtonian viscosity coefficient and normal stress effects in simple laminar shearing flows, appears to reflect a resonable compromise between simplicity and useful applicability to real materials. The use of this equation is illustrated by means of a study of rapid flows about submerged objects. The results of this study are compared with the usual boundary-layer theory for Newtonian fluids, and the implication of this comparison are discussed in some detail. (Author)

AD-616 084 Div. 9/1

Mechanical Technology, Inc., Latham, N. Y.
VISCOUS FLOW BETWEEN ROTATING CONCENTRIC CYLINDERS WITH A CIRCUMFERENTIAL PRESSURE GRADIENT AT SPEEDS ABOVE CRITICAL,
by R. C. Diprima. 22 Jun 64, 10p
Contract Nonr373100
Unclassified report

Pub. in ASLE Transactions v7 n4 p333-41 Oct 1964
(Copies not available to DDC or Clearinghouse customers).
Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, N. Y.

Descriptors: (*Lubrication, Fluid mechanics), (*Cylindrical bodies, Rotation), (*Vortices, Cylindrical bodies), Compressible flow, Stability, Pressure, Shear stresses, Nonlinear systems, Partial differential equations.

For sufficiently high speeds of the inner cylinder, the flow between concentric rotating cylinders with a circumferential pressure gradient is unstable. By considering the full nonlinear equations, the amplitude of the resulting vortex motion is computed. The effect of the vortex motion on the shear stress at the inner cylinder and the relation between the mean flow and the pressure gradient are discussed. (Author)

AD-616 088 Div. 25/6

Cornell Univ., Ithaca, N. Y.
LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS,
by N. W. Ashcroft and J. W. Wilkins. 20 Jan 65, 3p
Contract Nonr40138
Unclassified report

Prepared in cooperation with the Institute for the Study of Metals, Univ. of Chicago, Ill., Contract Nonr212122
Pub. in Physics Letters v14 n4 p285-7 Feb 15 1965
(Copies available only to DDC users).

Descriptors: (*Metals, Solid state physics), (*Specific heat, Metals), Phonons, Electrons, Long-temperature research, Green's function, Sodium, Aluminum, Lead, England.

It is reported that in simple metals the contribution to the low temperature electronic specific heat from the electron-phonon interaction dominates those from band structure and electron-electron interactions. Only the metals Na, Al and Pb have been considered since for them the band structures and Fermi surfaces are relatively well known and the phonon dispersion curves have been measured. With this data the calculations are performed with no adjustable parameters.

AD-616 090 Div. 25/6

Illinois Univ., Urbana. Dept. of Physics.
VISCOSITY OF TYPE-II SUPERCONDUCTORS,
by M. J. Stephen and J. Bardeen. 21 Dec 64, 2p
Contract DA31 124ARO D114
AROD 431:68
Unclassified report

Pub. in Physical Review Letters v14 n4 p112-3 Jan 25 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductors, Viscosity), Superconductivity, Voltage, Velocity, Electrical conductance, Electric currents, Mathematical analysis, Motion.

AD-616 092 Div. 25/3, 25/7

Research Lab. of Electronics, Mass. Inst. of Tech. Cambridge.
ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MnF2 NEAR THE TRANSITION TEMPERATURE,
by J. C. Burgiel and M. W. P. Strandberg. 1 Sep 64, 12p
Contract DA36 039AMC03200E
Unclassified report

Pub. in The Journal of Physics and Chemistry of Solids v26 p865-75 1965
(Copies available only to DDC users).

Descriptors: (*Antiferromagnetism, Manganese compounds), (*Manganese compounds, Fluorides), (*Transition temperature, Manganese compounds), (*Line spectrum, Resonance), Magnetic fields, Temperature, Density, Paramagnetic resonance.

The antiferromagnetic resonance (AFMR) linewidth of MnF2 was studied near the Neel temperature. In the presence of an applied magnetic field, the linewidth diverges approximately as the absolute value of (T-Tn) to the -5/6th power. In the absence of an applied field, the line-width is larger and diverges approximately as the absolute value of (T-Tn) to the -4/3rd power. The

linewidth is independent of the direction of the magnetic field and is the same for both branches of the AFMR spectrum. Though qualitative attempts to explain the temperature dependence both in the presence and absence of an applied magnetic field were made, a detailed theoretical explanation is still lacking. The independence of the linewidth on applied magnetic field direction and on AFMR mode are what we expect intuitively, although work by Mori and Kawasaki suggests that the linewidths for the two branches of the AFMR spectrum ought to be different. Above T sub n, the electron paramagnetic resonance (EPR) in MnF2 was observed. For H parallel to c, at temperatures near T sub n, the linewidth increases approximately as the absolute value of (T-Tn) to the -3/8th power. A smaller increase occurs for H perpendicular to c. The EPR data are discussed relative to the work of Heller and Benedek and of Moriya. (Author)

AD-616 095 Div. 25/6, 25/3
CFSTI Prices: HC$2.00 MF$0.50

Stanford Univ., Calif.
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY,
by Harold Levine. 28 May 65, 29p
Technical rept. no. TR-5
Contract Nonr22574, Proj. NR041 313
Unclassified report

Descriptors: (*Potential theory, Calculus of variations), (*Calculus of variations, Potential theory), (*Capacitors, Potential theory), (*Torsion bars, Potential theory), Boundary value problems, Green's function, Torque.

Although the theoretical and practical importance of variational techniques in potential theory has long been secure, fresh instances of their utility are not without interest. Two cases in point are detailed, one relating to the capacitance of a condenser formed by a centrally placed strip within a circular shell and the other relating to the torsional rigidity of a circular cylindrical bar with a radial slit. The high degree of geometrical symmetry reflected in these configurations affords a corresponding diversity in approaches to the concomitant boundary value problems; and it is noteworthy that the exercise of different procedural options furnishes variational characterizations with a complementary nature. Thus, in the foregoing examples, a pair of newly devised variational principles are shown to provide opposite bounds for the capacitance and torsional rigidity, respectively, from those associated with alternative (though more readily established) principles. It appears, furthermore, that the new variational formulations are especially suited to the circumstances wherein the larger values of the ratio of the strip, or slit, width to the circular diameter obtain, whereas the others enjoy a corresponding fitness if the ratio is small compared with unity. (Author)

AD-616 099 Div. 25/3, 9/1
CFSTI Prices: HC$3.00 MF$0.75

Williamson Development Co., Inc., Concord, Mass.
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS,
Final rept. for Mar 63-Mar 65,
by Arthur L. Besse, Balram Prasad, Pradip Bakshi, Kenneth I. Golden, and Ivan A. Nichols. 15 Mar 65, 88p
Contract AF19 628 2843, Projs. 8608, 8647,
Tasks 860802, 864701 2
AFCRL 65-315
Unclassified report

Descriptors: (*Plasma physics, Magnetic fields), (*Magnetohydrodynamics, Stability), X-rays, Exploding wires, Electron density, Interferometers, Lasers, Shock tubes, Electrical conductance, Hall effect.

Section I describes preliminary x-ray studies of high density plasmas produced by exploding wires. Symptoms of turbulence, which are always observable in light-picture studies, were not detected in the x-ray photographs. Further investigations are suggested wherein dual x-ray equipment might be used together with more accurate scanning techniques. Section II describes an interferometer with laser source as a means of determining electron densities. Further described therein is an electron beam instrument for determining heavy particle densities. Section III discusses the physical characteristics and implications of the moving radiation sources observed in the shock tube experiments. In Section IV, the electrical conductivity of a partially ionized gas in a uniform magnetic field is determined. This extension of the Sen-Wyller magneto-ionic theory was motivated by the fact that ionospheric, interstellar, and laboratory plasmas do contain neutral gas molecules. In Section V, a nonlinear analysis of plasma oscillations reveals the existence of: (1) composite modes resulting from the repeated mutual interaction of the incident field and plasma components; (2) an infinity squared of Larmor resonances. Section VI is a conjectural study of small amplitude wave motions in a two-stream hydromagnetic gas with Hall perturbations. (Author)

AD-616 110 Div. 25/3
CFSTI Prices: HC$3.00 MF$0.75

Little (Arthur D.) Inc., Cambridge, Mass.
CHARACTERISTICS OF METAL VAPORS,
Interim technical rept. 15 May 63-3 Sep 64,
by A. E. Wechsler, P. E. Glaser, and J. Jasperse.
Mar 65, 64p
Contract AF33 657 11735, Proj. 7063, Task 706303
ARL 65-53
Unclassified report

Descriptors: (*Metals, Vapors), (*Plasma physics, Absorption spectrum), (*Electric arcs, Heat transfer), Absorption(Physical), High-temperature research, Line spectrum, Sodium, Alkali metals, Electrodes, Optical equipment, Carbon, Tungsten, Copper, Graphite.

The objective of this experimental and analytical study is to determine the effects of metal vapors on the radiation heat transfer characteristics of arc and plasma systems. A high temperature absorption cell suitable for transmission measurements of alkali metal vapors at temperatures of 300 to 750C with vapor path lengths of 4 to 8 inches is described. The results of calibration tests using the absorption cell and an optical system capable of resolution of 1 to 8 A over the spectral region from 2000 to 9000 A are presented. Typical data on the transmission of sodium vapor are given, and methods of data reduction to obtain spectral absorption coefficients are proposed. A preliminary discussion of the radiation characteristics of vaporized electrode components such as tungsten, copper, and graphite is given. (Author)

AD-616 121 Div. 30/5, 25/3
CFSTI Prices: HC$2.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
ON THE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN,
Physical sciences research papers,
by Denis M. Coffey. May 65, 32p
Paper no. PSRP-106, AFCRL 65-324
Proj. 4642, Task 464203
Unclassified report

Descriptors: (*Plasma jets, Electrical impedance),

(*Electrical impedance, Plasma jets), (*Electrons, Density), Gases, Measurement, Polarization, Dielectric properties, Surface properties, Microwave equipment, Microwaves.

An analysis of a microwave impedance method for measuring electron density and effective electron collision frequency in a plasma column is reviewed. It is evident from laboratory observations that surface polarization effects may be present in the impedance method. Such a consideration alters the form of the usual expression for the complex dielectric constant of an ionized gas. (Author)

AD-616 130 Div. 8/6, 8/3
CFSTI Prices: HC$4.00 MF$1.00

Foreign Technology Div., Wright-Patterson AFB, Ohio.
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES),
by M. P. Dolukhanov, A. N. Kazantsev, B. A. Vvedenskii, and V. I. Siforov. 1959, 135p
F-TS-9491
TT 59-19518

Unclassified report

Trans. of Radiotekhnika i Elektronika (USSR) v2 n11 p1344-89, 1413-34 1957.

Descriptors: (*Radio waves, Propagation), (*Electronics, USSR), Ionospheric propagation, Troposphere, Radio reception, Radio interference.

Contents:
Studies on radio-wave propagation along the surface of the ground, in the USSR, by M. P. Dolukhanov
Ionospheric radio-wave propagation studies in the USSR, by A. N. Kazantsev
Studies on tropospheric propagation of meter, decimeter, and centimeter radio waves in the USSR, by B. A. Vvedenskiy and A. V. Sokolov
Development of noise stability theory in the USSR, by V. I. Siforov

AD-616 131 Div. 25/4, 25/1
CFSTI Prices: HC$3.00 MF$0.75

Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES,
by L. M. Brekhovskikh. 1958, 54p F-TS-9320
TT 59-14096

Unclassified report

Otrazhenie Ogranichennykh Volnovykh Puchkov i Impulsov, Trans. of Uspekhi Fizicheskikh Nauk (USSR) v50 n4 p539-76 1953.

Descriptors: (*Electromagnetic waves, Reflection), (*Mechanical waves, Reflection), (*Reflection, Mechanical waves), Electromagnetic wave reflections, Ultrasonic radiation, Light, Energy, Sound signals, USSR.

The reflection of a limited wave train and the reflection of an impulse from a plane boundary were investigated. When the beam or impulse struck the boundary at an angle close to the angle of total internal reflection, phenomena were encountered that were absent in the reflection of plane waves. Specifically studied were: (1) representation of a limited wave train in the form of superposition of plane waves, (2) the field of the reflected beam, (3) the displacement of the beam upon reflection, (4) the total internal reflection of a light beam, (5) reflection of ultrasonic beams, (6) the distribution of energy in the cross section of the reflected beam, (7) the energy flux in total internal reflection, and (8) reflection from an inhomogeneous medium. In the field of reflection of impulses, the general relations were examined, the law of conservation of impulses was studied, and the distortion of the impulse form in total internal reflection was considered. (Author)

AD-616 142 Div. 25/4

Naval Ordnance Test Station, China Lake, Calif.
INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM,
by Jean M. Bennett and E. J. Ashley. 27 Oct 64, 6p NOTS TP-3842
Task R360FR106 216 1R011 01 01
NAVWEPS 8752

Unclassified report

Pub. in Applied Optics v4 n2 p221-4 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mirrors, Metal films), (*Metal films, Infrared properties), (*Silver, Infrared properties), (*Gold, Infrared properties), (*Infrared radiation, Reflection), Infrared optical systems, Materials, Emissivity, Vapor plating, Heat transfer.

The reflectance of silver and gold evaporated in ultrahigh vacuum was measured in the wavelength range from 0.5 micron to 32 microns. It was found that the reflectance of both materials is higher than previously reported values, and that ultrahigh vacuum silver films have the highest infrared reflectance over an extended wavelength range of any known material. The infrared emittance of uhv gold films is nearly as low as that of silver and is smaller by nearly a factor of 3 than the value previously reported for this material. Since gold is chemically inert and its emittance apparently does not change with time, it should find wider application as a low infrared emittance material, particularly in problems involving radiative heat transfer. (Author)

AD-616 146 Div. 25/3, 25/6, 15/1

Lockheed Missiles and Space Co., Palo Alto, Calif. Research Labs.
SPATIAL VARIATION OF THE MAGNETIZATION ACROSS A FERROMAGNETIC THIN FILM IN THE BETHE-PEIERLS-WEISS APPROXIMATION,
by J. J. Pearson. 9 Nov 64, 4p

Unclassified report

Pub. in Physical Review v138 n1A pA213-6 Apr 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ferromagnetic materials, Films), (*Magnetic properties, Ferromagnetic materials), Surface properties, Temperature, Thickness, Spin, Hamiltonian, Statistical mechanics, Solid state physics.

The variation of the magnetization across a ferromagnetic film as a function of temperature and film thickness has been calculated in the Bethe-Peierls-Weiss approximation. In this approximation the Heisenberg exchange interaction between a given spin and the shell consisting of its nearest neighbors is treated exactly. The interaction of this shell with the rest of the sample is treated approximately, as an interaction with a molecular field. The extension to thin films was made by allowing this molecular field to vary across the film in the manner used by Valenta for the molecular-field approximation. The finite thickness of the film had little effect on the temperature variation of the magnetization, reducing the Curie temperature by only a few percent from the bulk value even for films as thin as eight layers. The spatial falloff of the magnetization at

the surface was even more abrupt than in the molecular-field case and almost independent of film thickness. For a film of twenty layers, the magnetization fell at the surface to 60% of its value at the center and almost the entire drop occurred within four layers. The temperature dependence was found to be very sensitive to the method of determining the molecular field. (Author)

AD-616 150 Div. 25/4, 25/7

Lyman Lab. of Physics, Harvard Univ., Cambridge, Mass.
SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
Revised ed.,
by Howard C. Berg. 6 Nov 64, 14p
Unclassified report

Research supported by National Science Foundation and Office of Naval Research, Washington, D. C.
Pub. in Physical Review v137 n6A pA1621-34 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 12 Aug 64.

Descriptors: (*Masers, Hydrogen), (*Surface properties, Masers), (*Hyperfine structure, Hydrogen), Spin, Relaxation time, Atoms, Electron transitions, Quantum mechanics, Deuterium, Oxygen, Nitrogen compounds, Oxides.

An experiment using the atomic-hydrogen maser is described which confirms several predictions of the theory of spin exchange and which provides new information on the spin relaxation of hydrogen at solid surfaces. Atoms in the (F = 1, m = 0) state, which are confined to a storage bulb, are put into a coherent radiating state by a microwave pulse at the delta m = 0 hyperfine frequency. The initial amplitude and the decay rate of the induced signal are measured. Atoms or molecules containing unpaired electrons are added to the storage bulb at various constant rates, and the pulse measurements are repeated. In this manner, the rate at which spin-exchange collisions decrease the oscillating dipole movement of the radiating gas is compared with the rate at which the same collisions decrease the population difference (F = 1, m = 0) - (F = 0, m = 0). It is shown for a spin-exchange theory which neglects spin-orbit coupling and all direct magnetic interactions that the ratio of the relaxation times, T sub 2/T sub 1 is independent of all collision parameters. For collisions between atomic hydrogen and atomic deuterium, nitric oxide, and molecular oxygen, the predicted T sub 2/T sub 1 ratios are 4/3. For hydrogen-hydrogen collisions, the predicted T sub 2/T sub 1 ratio is 2. The deuterium, nitric oxide, and oxygen results agree with the theory, but the hydrogen results are at least 5% low. (Author)

AD-616 157 Div. 20/1, 20/2

Lockheed Missiles and Space Co., Palo Alto, Calif.
ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES,
by D. E. Golden and H. W. Bandel. 6 Nov 64, 8p
Unclassified report

Pub. in Physical Review v138 n1A pA14-21 Apr 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrons, Scattering), (*Helium, Scattering), Differential cross section, Electron beams, Attenuation, Probability, Energy, Pressure.

The Ramsauer technique has been used to measure the absolute total electron-helium-atom scattering cross section as a function of electron energy from 0.30 to 28 eV with an estimated probable error of ±3%. No 'fine structure' has been observed at the lower electron energies studied. The variation of the cross section with energy for energies less than 3 eV is in reasonable agreement with the modified effective-range formula given by O'Malley, using a scattering length of 1.15a sub o. The cross section first increases with decreasing electron energy from 2.2 A sq at 28.0 eV to a maximum of 5.6 A sq at about 1.2 eV and then decreases to 5.4 A sq at 0.300 eV. The cross section has been found to decrease sharply with increasing energy at about 0.5 eV below the first excitation energy. This resonance, predicted by Baranger and Gerjuoy and originally observed by Schulz, first decreases with increasing energy to a minimum of about 10% below the background at 19.285±0.025 eV and then increases to a gentle maximum of about 3% above the background at 19.65±0.05 eV. The resolution of this resonance as well as the 10% decrease in the cross section at the minimum is determined by the half-width of the electron beam at this energy which is about 0.1 eV. (Author)

AD-616 161 Div. 25/8, 4/4, 14/8

Bell Telephone Labs., Inc., Murray Hill, N. J.
ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS,
by H. L. Frisch. 28 Jul 64, 6p
Unclassified report

Pub. in Journal of Chemical Physics v41 n12 p3679-83 Dec 15 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Phase studies, Transformations), (*Diffusion, Thermodynamics), (*Polymers, Diffusion), (*Sorption, Thermodynamics), Transition temperature, Glass, Fluid flow, Chemical equilibrium, Penetration.

Following Simon, we define fluid systems with a 'glass-like' transition as systems which above the transition temperature are, and below the transition temp. are not in internal chemical equilibrium with respect to a set of unspecified internal parameters of even tensorial rank. Flow equations for the chemical components of such systems are presented in various frames of references. In particular, in a mass-fixed frame of reference, besides a variation in the Onsager coefficients, the flow equations below the transition temp. are subject to a different set of subsidiary conditions (the 'new' Gibbs-Duhem equations). The consequences of the assumption of sorption equilibrium at the surface of the diffusion system are studied. Below the transition temp. these systems will possess history-dependent diffusion coefficients and be subject to time-dependent surface concentrations. These time dependencies are related to the relaxation of the internal parameters of the system below the transition temp. (Author)

AD-616 173 Div. 25/3, 25/2, 25/6

National Magnet Lab., Mass. Inst. of Tech., Cambridge.
ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINDKY-MORIYA COUPLING; ORIENTATION DEPENDENCE IN ALPHA-Fe203,
by Samuel J. Williamson and Simon Foner.
9 Jun 64, 5p
Contract AF19 604 7344
AFOSR 65-0737
Unclassified report

Pub. in Physical Review v136 n4A pA1102-6 Nov 16 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Antiferromagnetism, Resonance), (*Iron compounds, Antiferromagnetism), Crystal

lattices, Anisotropy, Magnetic fields, Nuclear spins, Atomic orbitals, Microwave frequency.

Resonance conditions for an antiferromagnet whose sublattice magnetization vectors are canted by the Dzyaloshinsky-Moriya interaction are generalized to include an arbitrary angle between the applied magnetic field and the hard direction of magnetization, and the resulting normal modes are discussed. A correction term to the low-frequency resonance expressions derived by Pincus may be appreciable at higher magnetic fields and small angles. For suitable parameters, this term permits the measurement of all pertinent effective fields by resonance experiments. It is furthermore shown that demagnetization effects are negligible. Microwave resonance experiments as a function of field (to 60 kG), angle, and frequency (12 to 35Gc/sec) on synthetic single crystals of alpha-Fe2O3 failed to reveal a departure from the Pincus relation, thus leading to the conclusion that H-A/H-E<0.01. (Author)

AD-616 174 Div. 25/6, 25/3, 25/5

National Magnet Lab., Mass. Inst. of Tech., Cambridge.
INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT,
by S. J. Williamson, S. Foner, and R. A. Smith.
18 Jun 64, 3p
Contract AF19 604 7344
AFOSR 65-0736

Unclassified report

Pub. in Physical Review v136 n4A pA1065-7 Nov 16 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Metals, Atomic energy levels), (*Atomic energy levels, Magnetic fields), (*Magnetic fields, Oscillation), Electron transitions, Crystals, Momentum, Quantum mechanics, Crystal lattice defects.

Dingle's treatment of the influence of Landau level broadening on the de Haas-van Alphen effect is extended by the method of Lifshitz and Kosevich to include a Fermi surface of arbitrary shape. It is shown that a momentum- or energy-dependent linewidth can influence the period, phase, and amplitude of the magnetization oscillations, although crude estimates indicate that in many cases the effects would be quite small. (Author)

AD-616 176 Div. 8/3, 25/3

Firestone Flight Sciences Lab., Calif. Inst. of Tech., Pasadena.
TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS,
by Anthony Demetriades and Jack H. Hill.
13 Mar 64, 7p
Contract DA31 124ARO D33

Unclassified report

Pub. in Journal of Applied Physics v36 n3 pt1 p747-53 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electronic equipment, Transients), (*Transients, Space charges), (*Gas ionization, Space charges), (*Space charges, Motion), Electric arcs, Electric currents, Electrons, Ionic current, Mathematical models, Partial differential equations, Electric fields, Nonlinear systems, Electrodes, Gases.

The history of motion of charge carriers generated in a gap by ionizing radiation is investigated. The study is limited to cases where the field-induced motion of these carriers overcomes their inertia and diffusion; the motion is thus completely collision-dominated. The severity of the space-charge effect is described by a single non-dimensional parameter gamma. When gamma is not much smaller than unity, usual linearization procedures are inapplicable. The nonlinear problem is solved for two limiting cases. In the first, the electric current is carried by the free electrons and ions as originally created. In the second, the electric current is carried by positive and negative ions, the latter formed by electron attachment. The method of characteristics is employed to solve the equations of motion and exact analytical and numerical solutions are presented. It is shown that if gamma >2 the nonlinear effects of the induced charges are important and depart appreciably from calculations based on linear approximations. (Author)

AD-616 182 Div. 25/5, 20/2

Harvard Univ., Cambridge, Mass.
FIELD THEORY OF MATTER. II,
by Julian Schwinger. 21 Jul 64, 4p
Contract AF49 638 1380, Proj. 9751, Task 9751 01
AFOSR 65-0465

Unclassified report

Pub. in The Physical Review v136 n6B pB1821-4 Dec 21 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elementary particles, Field theory), (*Field theory, Elementary particles), Nuclear particles, Electromagnetic fields, Resonance, Parity, Operators-(Mathematics), Baryons.

A qualitative dynamical interpretation is given for observed regularities of nonleptonic phenomena in strong, electromagnetic, and weak interactions. (Author)

AD-616 183 Div. 20/2, 15/1, 25/5

Stanford Univ., Calif.
BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS,
by S. D. Drell, A. C. Finn, and A. C. Hearn.
30 Jul 64, 13p
Contract AF49 638 1389
AFOSR 65-0466

Unclassified report

Pub. in Physical Review v136 n5B pB1439-51 Dec 7 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Field theory, Nuclear physics), (*Special functions(Mathematical), Propagation), Quantum mechanics, Relativity theory, Nuclear models, Annihilation reactions, Electrons, Positrons, Pions, Photons, Nucleons, Polarization.

Several bounds are constructed on renormalization constants and on the asymptotic behavior of propagation functions and vertices. The inputs are experimental measurements and/or analyticity properties of vertex functions. We also discuss the connection between zeros in propagators, poles in vertex functions, and the values of coupling constants. This is the problem studied by Geshkenbein and Ioffe and by Meiman, and we discuss the possible physical significance of such zeros in terms of an extended Lee model. In particular we argue on the basis of this model and the scattering amplitude derived from it that there is no reason to exclude the existence of zeros in the propagator. This negates the arguments given for bounding the coupling constants in field theory. (Author)

AD-616 184 Div. 25/6, 25/1

Purdue Univ., Lafayette, Ind.
OSCILLATORY CURRENT BEHAVIOR IN GaSb AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX,
by Philip O. Sliva and Ralph Bray. 1 Feb 65, 6p
AROD 3655:20

Unclassified report

Pub. in Physical Review Letters v14 n10 pC504 1-5-5 Mar 8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gallium alloys, Antimony alloys), (*Antimony alloys, Gallium alloys), (*Semiconductors, Ultrasonic radiation), (*Intermetallic compounds, Electric currents), Hall effect.

The spontaneous production of large, coherent current oscillations was observed in p-type GaSb, in the megacycle/second range, upon application of electric-field pulses above a critical strength. The oscillatory effects can be interpreted in terms of the generation and propagation of ultrasonic flux which is strongly amplified by interaction with the free carriers. The effect manifests itself in the creation and growth of observable domains of excess resistance which move through the sample with a velocity closely corresponding to acoustic velocities. The frequency of the oscillations in GaSb is determined not only by the one-way transit time of such a domain but also by the number of generating sites, which can be deliberately controlled.

AD-616 193 Div. 25/5, 20/2

High-Energy Physics Lab., Stanford Univ., Calif.
ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11,
by R. E. Rand, R. Frosch, and M. R. Yearian.
4 Jan 65, 4p HEPL-357
Contract Nonr22567, Proj. NR022 026

Unclassified report

Pub. in Physical Review Letters v14 n7 p234-7 Feb 15 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Beryllium, Electron scattering), (*Boron, Electron scattering), (*Electron scattering, Nuclear cross sections), (*Magnetic moments, Analysis), Dipole moments, Nuclear shell models, Nuclear energy levels, Nuclear spins, Magnetic fields.

The magnetic form factors of Be(9) and B(11), both spin-3/2 P-shell nuclei, have been measured in the q sq range up to 6 F(-2) by electron scattering at an angle of 180 degrees. The results can be interpreted in terms of form factors for the magnetic dipole and octopole moments of these nuclei. These experiments give for the first time a method of studying the properties of the octopole moment in light nuclei.

AD-616 200 Div. 25/6

Brandeis Univ., Waltham, Mass.
IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS,
by C. W. Kilmister and F. A. E. Pirani.
2 Apr 64, 12p
Grant AF AFOSR368 63, Proj. 9751, Task 975101
AFOSR 65-0821

Unclassified report

Prepared in cooperation with King's Coll., Univ. of London (England). Pub. in Cambridge Philosophical Society. Proceedings (Gt. Britain) v61 p211-22 1965 (Copies available only to DDC users).

Descriptors: (*Mechanics, Theory), Motion, Dynamics, Groups(Mathematics), Topology, Differential geometry.

It is shown, for a classical dynamical system with a Lagrangian, that the existence of an ignorable coordinate is equivalent to the vanishing of a certain Lie derivative. On this covariant description is based a new definition of steady motion. A definition given earlier by Synge is criticized. (Author)

AD-616 202 Div. 25/3

Pennsylvania State Univ., University Park.
THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION,
by P. H. Cutler and D. Nagy. 31 Aug 64, 28p
Grants AF AFOSR100 61, AF AFOSR213 63
AFOSR 65-0782

Unclassified report

Pub. in Surface Science v3 n1 p71-94 Jan 1965
(Copies available only to DDC users).

Descriptors: (*Field emission, Theory), (*Potential theory, Field emission), Quantum mechanics, Electrons.

It is well known that for fields < or = 10 to the 7th power V/cm the observed field emitted current density is in agreement with the Fowler-Nordheim theory using the classical image-force barrier for the model of the surface potential. However, for fields > or = 5 x 10 to the 7th power V/cm, the measured current densities deviate from the linear log j versus 1/F curve, becoming progressively less than predicted values as the field increases. It was suggested that the departures from theory were due to space-charge distortions of the cathode field by high current densities. There are, however, other effects that occur at high fields which may also produce significant departures from the Fowler-Nordheim Law. One such possibility is the inaccuracy of the classical image-force barrier at small distances (several angstroms) from the surface. We have examined the effect of a modified surface potential barrier on the emitted current and energy distributions in the field emission region. The new potential represents quantum modifications to the classical image-force and is based on quantum-mechanical calculations of the electronic potential in the surface region of a metal. The result for the current density is obtained in analytic form. Deviations from the linear Fowler-Nordheim plot begin about 5 x 10 to the 7th power V/cm and decrease progressively to a value about 4% lower at the highest fields. Energy distributions of the field emitted electrons have been calculated for the normal and total energy cases. These are given for the zero temperature limit and the T-F region. (Author)

AD-616 203 Div. 25/6, 25/1

Brown Univ., Providence, R. I.
STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM. Revised ed.,
by Lewis T. Claiborne, Jr. and Robert W. Morse.
16 Jul 64, 13p
Grant AF AFOSR267 63
AFOSR 65-0784

Unclassified report

Pub. in Physical Review v136 n4A pA893-905 Nov 16

1964 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 18 Feb 64.

Descriptors: (*Aluminum, Shear stresses), (*Superconductivity, Aluminum), (*Mechanical waves, Attenuation), (*Ultrasonic radiation, Aluminum), Cryogenics, Transition temperature, Single crystals, Electrons, Relaxation time, Temperature.

Measurements were made of the ultrasonic shear wave attenuation in superconducting aluminum, using 99.999% pure single crystals with parallel faces in the (100), the (110), and the (111) directions. It was found that the temperature dependence of the attenuation could be separated into two parts: a sharp decrease in attenuation very close to the transition temperature and a residual attenuation having a temperature dependence similar to that for the longitudinal waves. The method of adiabatic demagnetization was used to lower the temperature to 0.3 K, and an extrapolated plat of the residual attenuation in this range could be used to determine an effective BCS energy gap. The fraction of the total attenuation represented by the residual attenuation was found to be strongly temperature-dependent. Application of a magnetic field was found to lower the transition temperature as would be expected. In fact, it was found that the method of ultrasonic attenuation could be used to determine the critical fields accurately near the zero-field value, where permeability measurements are difficult. A theory was developed to explain the behavior of the shear-wave attenuation as a function of temperature. The formulation began with approximations which should be valid in the London region and employed a self-consistent method for determining the dissipative forces on the lattice. (Author)

AD-616 205 Div. 20/1, 15/1, 25/5

Boston Univ., Mass.
SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES,
by W. S. Hellman and P. Roman. 5 Nov 64, 2p
Grant AF AFOSR385 63, Proj. 9751, Task 975101
AFOSR 65-0822

Unclassified report

Pub. in Physics Letters v13 n4 p336-7 Dec 15 1964 (Copies available only to DDC users).

Descriptors: (*Field theory, Special functions(Mathematical)), (*Special functions(Mathematical), Field theory), Quantum mechanics, Nucleons, Pions.

In recent investigations concerning restrictions placed on Lagrangian field theories the positive definiteness of the spectral weight function was found to be crucial for the results obtained. This note indicates that the requirement of positive definiteness might be too strong. A model is considered of nucleons and pions with pseudo-scalar coupling and with the bare pion mass set equal to 0. The ensuing discussion implies that the condition of non-negativeness on the spectral weight function is too strong for local Lagrangian theories. (Author)

AD-616 206 Div. 25/5

Boston Univ., Mass.
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
by R. Acharya, Meinhard E. Mayer, Howard J. Schnitzer, E. C. G. Sudarshan, and M. Y. Han.
8 Jun 64, 5p
Grant AF AFOSR385 63, Proj. 9751, Task 9751 01
AFOSR 65-0823

Unclassified report

Pub. in The Physical Review v136 n3B pB888-92 Nov 9 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Groups(Mathematics), Field theory), (*Relativity theory, Field theory), Differential geometry, Hamiltonian, Algebras, Quantum statistics.

Several theorems are proved which exhibit the impossibility of constructing nontrivial products of the Lorentz group with internal symmetry groups for some physically interesting examples. It is also shown that if the Lorentz group is replaced by the Galilei group, qualitatively different results are obtained; a 'linear' breakdown of internal symmetry is possible. (Author)

AD-616 207 Div. 20/1, 15/1

Boston Univ., Mass.
COVARIANT MERGING OF SPIN AND UNITARY SPIN,
by P. Roman and J. J. Aghassi. 30 Nov 64, 3p
Grant AF AFOSR385 63, Proj. 9751, Task 9751 01
AFOSR 65-0824

Unclassified report

Pub. in Physical Letters v14 n1 p68-70 Jan 1 1965 (Copies available only to DDC users).

Descriptors: (*Nuclear spins, Matrix algebra), Groups-(Mathematics), Algebra, Elementary particles, Mesons, Baryons.

AD-616 209 Div. 25/6

Cornell Univ., Ithaca, N. Y.
SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE,
by Billy Lee Crowder and M. J. Sienko. 7 Aug 64, 6p
Grant AF AFOSR62 218, Proj. 9761, Task 9761 03
AFOSR 65-0801

Unclassified report

Pub. in Inorganic Chemistry v4 p73-7 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Solid state physics, Tungsten compounds), (*Tungsten compounds, Oxides), (*Single crystals, Tungsten compounds), Hall effect, Resistance(Electrical), Thermoelectricity, Phase studies.

The Hall voltage, electrical resistivity, and thermoelectric power have been measured as a function of temperature on single crystals of WO3 in the range 140-300 degrees K. Discontinuities appear on cooling at approximately +10 and -40 degrees, corresponding, respectively, to a monoclinic-to-triclinic (gamma-to-beta) and a piezoelectric-to-ferroelectric (beta-to-alpha) transition. The gamma-to-beta transition is strongly dependent on the domain characteristics and the impurity concentrations of the individual crystals. Introduction of oxygen vacancies leads to disappearance of the discontinuities at +10 and -40. (Author)

AD-616 210 Div. 25/6, 25/3, 8/3

Illinois Univ., Urbana. Dept. of Physics.
ELECTRON HALL MOBILITY IN THE ALKALI HALIDES,
by R. K. Ahrenkiel and Frederick C. Brown.
4 May 64, 9p
Grant AF AFOSR62 215
AFOSR 65-0800

Unclassified report

Pub. in Physical Review v136 n1A pA223-31 Oct 5 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hall effect, Transients), (*Alkali metal compounds, Hall effect), (*Potassium compounds, Hall effect), (*Sodium compounds, Hall effect), (*Halides, Hall effect), Crystals, Bromides, Chlorides, Iodides, Photoconductivity, Color centers, Electrons, Scattering, Excitation, Illumination.

New results are presented on the mobility of electrons in alkali-halide crystals down to the temperature of liquid helium. An improved technique was used to observe the transient Hall effect for electrons released from color centers by light. Optical-mode scattering with mobility dependent upon exp(theta/T) was generally observed above 40K. The Debye temperature theta can be compared with the optical-mode frequency of the material, whereas the magnitude of the scattering can be used to estimate band and polaron mass parameters. Mobilities as high as 15 000 sq cm/V-sec, depending upon F-center density, were observed for lightly colored crystals of KBr at 7K. Similar high mobilities were found for KI and a sample of zone-refined KCl, but the largest mobility observed in NaCl was 1200 sq. cm/V-sec. The low-temperature mobility in KBr could be reduced an order of magnitude by optically converting F centers (neutral defects) to F' and a centers (charged defects). The original mobility could then be restored by illumination in the F' band at low temperature. (Author)

AD-616 212 Div. 25/6, 25/2

Rutgers - The State Univ., New Brunswick, N. J.
A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XENON,
by J. S. Brown. 12 Oct 64, 4p
Grant AF AFOSR167 62, Proj. 9761, Task 976101
AFOSR 65-0795
Unclassified report

Pub. in Physical Society. Proceedings v85 pt2 n544 p394-7 1965 (Copies available only to DDC users).

Descriptors: (*Solidified gases, Crystal lattices), (*Neon, Crystal lattices), (*Xenon, Crystal lattices), Vibration, Isotopes, Tables, Cryogenics.

AD-616 213 Div. 25/8, 25/6

Rutgers - The State Univ., New Brunswick, N. J.
CRITICAL ANALYSIS OF THE THERMODYNAMIC DATA FOR Pt AND A PREDICTION OF THETA (DW) (T),
by J. L. Feldman and G. K. Horton. 2 Sep 64, 4p
Grant AF AFOSR167 62
AFOSR 65-0796
Unclassified report

Pub. in Physical Review v137 n4A pA1106-8 Feb 15 1965.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thermodynamics, Platinum), (*Platinum, Thermodynamics), Mossbauer effect, Specific heat, Thermal expansion, Crystal lattices.

An examination is made of the available measurements of the specific heat, thermal expansion, and compressibility of Pt to see whether reliable predictions can be made for Theta (DW) (T), the Debye characteristic temperature of the Debye-Waller factor. Prediction is shown to be possible since Theta (DW) (T) varies little and is not sensitive to the detailed properties of the vibrational density of states.

AD-616 214 Div. 20/1, 25/5, 15/1

California Univ., Berkeley.
EVIDENCE THAT THE DEUTERON IS NOT AN ELEMENTARY PARTICLE,
by Steven Weinberg. 30 Sep 64, 7p
Grant AF AFOSR232 63
AFOSR 65-0816
Unclassified report

Pub. in Physical Review v137 n3B pB672-8 Feb 8 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Deuterons, Elementary particles), (*Elementary particles, Deuterons), Nuclear binding energy, Quantum mechanics, Potential theory, S-matrix, Probability, Integral equations.

If the deuteron were an elementary particle then the triplet n-p effective range would be approximately - ZR/(1-Z), where R=4.31F is the usual deuteron radius and Z is the probability of finding the deuteron in a bare elementary-particle state. This formula is model-independent, but has an error of the order of the range 1/m=1.41F of the n-p force, so it becomes exact only in the limit of small deuteron binding energy, i.e., R>>1/m. The experimental value of the effective range is not of order R and negative, but rather of order 1/m and positive, so Z is small or zero and the deuteron is mostly or wholly composite. (Author)

AD-616 215 Div. 25/2, 25/6

Columbia Univ., New York.
DISLOCATION VELOCITIES IN A LINEAR CHAIN,
by J. H. Weiner. 3 Jun 64, 6p
Grants AF AFOSR228 63, NSF G19010,
Proj. 9761, Task 976101
AFOSR 65-0783
Unclassified report

Pub. in The Physical Review v136 n3A pA863-8 Nov 2 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Crystal lattice defects, Stresses), Shear stress, Thermal stresses, Velocity, Deformation, Loading(Mechanics).

Dislocation velocities as a function of applied stress are computed for a modified Frenkel-Kontorova model. The analysis is approximate in that only localized normal modes of motion (local modes) are considered and it is found that steady-state velocities are attained because of imperfect transfer of energy between successive local modes. The significant stress parameter for this model is found to be the dynamic Peierls stress sigma (PD) with the property that dislocation motion will be maintained for any stress sigma > sigma (PD), without the aid of thermal motion, upon condition that the dislocation has surmounted one potential barrier while the stress is applied. For the model parameters here considered, sigma (PD) of about 0.01 sigma (P), where sigma (P) is the static Peierls stress. The model calculations show the extreme stress sensitivity of dislocation velocity at low velocities which has been observed experimentally. Finite-difference calculations show that the local-mode approximation gives reasonably good accuracy up to dislocation velocities approximately 0.7 the speed of wave propagation for infinite wave length in the linear chain. (Author)

AD-616 216 Div. 20/2

Colorado Univ., Boulder.
I=O PION-PION AMPLITUDE AND SIGMA DI-PION,
by A. O. Barut and W. S. Au. 5 Jun 64, 3p
Grant AF AFOSR30 63, Proj. 9751, Task 975103
AFOSR 65-0815 Unclassified report

Pub. in Physical Review Letters v13 n5 p165-7
Aug 3 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Pions, Meson scattering), (*Meson cross sections, Pions), Resonance scattering, Nuclear spins, K mesons.

AD-616 217 Div. 25/5, 15/1, 25/3

Stanford Univ., Calif.
SPIN AND GRAVITATION,
by Heinz Pagels. 31 Jan 64, 24p
Grant AF AFOSR62 452
AFOSR 65-0814

Unclassified report

Pub. in Annals of Physics v31 n1 p64-87 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gravity, Transformations(Mathematics)), (*Spin, Transformations(Mathematics)), (*Electromagnetic fields, Theory), (*Elementary particles, Field theory), Quantum mechanics, Relativity theory, Groups(Mathematics), Operators(Mathematics), Tensor analysis, Algebraic topology, Differential geometry, Dynamics, Electrons.

Consideration is given to the properties of certain classical fields as revealed by breaking the symmetry of groups of transformations which characterize the physical geometry. Topics include: flat space-time; electromagnetism; spinors in a Riemann space; gravitation and spin; gravitational dynamics: the Einstein equations and spin; gravitational field interacting with an electron.

AD-616 219 Div. 20/1, 15/1

Washington Univ., St. Louis, Mo. Dept. of Physics.
MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS,
by Eugene Feenberg and Chia-Wei Woo.
15 May 64, 15p
Grants AF AFOSR62 412, NSF B22296
AFOSR 65-0811

Unclassified report

Pub. in The Physical Review v137 n2A pA391-405
Jan 18 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Fermions, Matrix algebra), (*Matrix algebra, Helium), (*Helium, Liquefied gases), Hamiltonian, Atomic energy levels, Spin, N-body problem, Excitation, Bosons, Determinants, Series, Integrals, Functions.

The ground state and low excited states of liquid He3 (and other fermion systems) can be constructed from a set of basis functions. Diagonal and nondiagonal matrix elements of the identity and the Hamiltonial operator are elevated by a cluster-expansion technique. An orthonormal basis system is constructed from the set of basis functions and used to express the Hamiltonian operator in quasiparticle form: a large diagonal component containing constant, linear, quadratic, and cubic terms in free-quasiparticle occupation-number operators and a nondiagonal component representing the residual interactions involved in collisions of two and three free quasiparticles. (Author)

AD-616 220 Div. 25/6

California Univ., Riverside. Dept. of Physics.
HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID,
by Joseph Callaway and David M. Edwards.
13 Jul 64, 8p
Grant AF AFOSR318 62, Proj. 9761, Task 976101
AFOSR 65-0802

Unclassified report

Pub. in The Physical Review v136 n5A pA1333-40
Nov 30 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Solid state physics, Magnetic properties), (*Magnetic properties, Solid state physics), High-temperature research, Electrons.

A pair of electrons in an energy band which interact through a short-range potential is considered. The scattering amplitude is determined exactly, and the energies of states in which the two particles are bound together are found. The change in the density of two-particle states produced by the interaction is computed and used to calculate the second virial coefficient occurring in the expansion of the logarithm of the partition function in powers of the density. Inclusion of an external magnetic field allows determination of the magnetic susceptibility at high temperatures. The result has a form equivalent to that obtained in Stoner's theory of ferromagnetism, thereby justifying that theory in the high-temperature region and yielding an expression for the molecular-field parameter theta prime. (Author)

AD-616 221 Div. 25/2

California Univ., Riverside. Dept. of Physics.
ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM,
by A. James Hughes and Joseph Callaway.
2 Jul 64, 8p
Grant AF AFOSR318 62, Proj. 9761, Task 976101
AFOSR 65-0803

Unclassified report

Pub. in The Physical Review v136 n5A pA1390-7
Nov 30 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sodium, Crystal structure), Brillouin zones, Crystal lattices, Spectroscopy, Energy.

The band structures of both the body-centered cubic and the hexagonal close-packed phases of sodium have been computed using a pseudopotential method. The pseudopotential parameters were obtained from spectroscopic data for the free sodium atom. The Fermi surface is nearly spherical in both phases, with the maximum distortion being of the order of 1/4%. Within the accuracy of the calculation, the Fermi energy and effective mass are the same in the two phases. (Author)

AD-616 222 Div. 30/3

Washington Univ., St. Louis, Mo. Dept. of Physics.
GATED INTEGRATOR FOR REPETITIVE SIGNALS,
by Jonathan Reichert and Jonathan Townsend.
28 Jan 63, 6p
Grant AF AFOSR62 320, Proj. 9763, Task 976303
AFOSR 65-0804

Unclassified report

Pub. in The Review of Scientific Instruments v35 n12 p1692-7 Dec 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Integrators, Gates(Circuits)), (*Pulse

integrators, Signals), (*Spectrum analyzers, Integrators), Signal-to-noise ratio, Nuclear magnetic resonance, Nuclear spectroscopy, Amplifiers, Feedback, Time.

A gated integrator, using standard analog computing amplifiers, is described. Because of the placement of the diode gate within the feedback integrating loop, many of the previous requirements of high quality insulation and high input impedance electrometers are eliminated. The 'holding time' of the integrator is such that, for an 'integrating time' of 0.0001 sec, the time required for a drift of 1% of full-scale (50 V output) is at least 17 min. The minimum sampling time is 0.5 microsec. A method for taking data using two such integrators and a calibrated signal is also presented. (Author)

AD-616 223 Div. 25/8, 15/1, 25/4

Imperial Coll. of Science and Tech., London (England).
TEMPORAL COHERENCE OF BLACK BODY RADIATION,
by Y. Kano and E. Wolf. 30 Apr 62, 5p
Grant AF AFOSR62 246
AFOSR J508

Unclassified report

Pub. in Proceedings of the Physical Society v80 (pt6) n518 p1273-6 1962.
(Copies available only to DDC users).

Descriptors: (*Blackbody radiation, Optical analysis), Functional analysis, Complex variables, Tensor analysis.

The temporal complex coherence function of blackbody radiation is calculated and is found to be expressible in terms of the generalized Riemann zeta-function. Curves are given which show the variation of the absolute value and of the argument of the temporal complex degree of coherence gamma(tau) as functions of increasing time delay tau. It is shown that the analytic continuation of gamma(tau) has no zeros in the lower half of the complex tau plane. This result supports the theory proposed in the accompanying paper by Wolf (Proc. Phys. Soc. 80,1269) about the possibility of determining certain energy spectra from measurements of the absolute value of the degree of coherence. (Author)

AD-616 224 Div. 25/6, 25/2

Pennsylvania Univ., Philadelphia. Lab. for Research on the Structure of Matter.
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE Tm(+3) ION IN LUTETIUM IRON GARNET,
by M. E. Caspari, A. Koicki, S. Koicki, and G. T. Wood. 1964, 2p
AROD 4387:3

Unclassified report

Summary of paper presented at a conference.
Full papers will be published in Physical Review and Physical Letters.
Work supported by the Army Research Office (Durham) and The National Science Foundation.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thulium, Electromagnetic properties), (*Garnet, Impurities), Ions, Magnetic fields, Electrons, Relaxation time, Atomic orbitals, Ytterbium, Electron capture, Gamma emission, Low-temperature research, Lutetium compounds, Iron compounds, Crystals.

The rotation and attenuation of the 177-133 keV gamma-gamma angular correlation in Tm(169) following the K capture of Yb(169) was determined at room temperature and at liquid nitrogen temperature in polycrystalline samples of LuIG to which were added a few atomic per cent of Yb(169). Experiments were carried out with a magnetic field applied perpendicular to the plane containing the gamma-ray counters. The samples could be saturated with fields as low as 500 Oe.

AD-616 230 Div. 25/7, 25/4, 4/4

Texaco Experiment, Inc., Richmond, Va.
APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET. Technical rept.,
by P. L. Goodfriend and H. P. Woods.
14 Sep 64, 5p Rept. nos. TP-230, EXP-223
Contracts Nonr188300, AF04 611 6083

Unclassified report

Rept. on Investigation of the Dissociation Chemistry of -NF2 Compounds.
Pub. in Review of Scientific Instruments v36 n1 p10-12 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ultraviolet spectroscopy, Instrumentation), Photochemistry, Reaction kinetics, Flash lamps, Circuits, Vacuum apparatus, Calcium compounds, Nitrogen compounds, Fluorides, Dissociation.

A description of an apparatus for flash photolysis kinetic spectroscopy is given. This apparatus allows spectra of transient species to be observed in the vacuum ultraviolet down to the fluorite cutoff and allows photolysis radiation with wavelengths as low as 1650 A to be utilized. (Author)

AD-616 234 Div. 25/3, 2/6

Iowa State Univ., Iowa City.
ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE,
by J. A. Van Allen. 18 Nov 64, 1p
Contract Nonr150906

Unclassified report

Pub. in Journal of Geophysical Research v70 n5 p1240 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers). Manuscript version available from CFSTI HC$1.00, MF$0.50 as N65-14958.

Descriptors: (*Magnetohydrodynamics, Particle trajectories), (*Particle trajectories, Invariance), (*Charged particles, Motion), Magnetic fields, Momentum, Van Allen radiation belt.

It is shown that the Alfven quantity (sin sq. alpha)/B, where alpha=instantaneous pitch angle and B=magnetic vector, is a rigorous constant of the motion of an isolated, electrically charged particle in the field of a magnetic unipole.

AD-616 242 Div. 20/1
CFSTI Prices: HC$6.00 MF$1.25

Kansas Univ., Lawrence.
STRUCTURE OF LOW-MEDIUM MASS NUCLEI,
ed. by L. W. Seagondollar. 6 Mar 64, 225p
ARL 65-63

Unclassified report

Symposium held at the University of Kansas, Lawrence, 5-6 Mar 64.

Descriptors: (*Nuclear structure, Symposia), Nuclear shell models, Nuclear energy levels, Calcium, Isotopes,

Phosphorus, Nuclear spectroscopy, Aluminum, Proton capture, Alpha particle reactions, Nuclear resonance, Gamma-proton reactions, Nuclei.

Contents:
Properties of some nuclear states in the A = 28 - 40 region, by P. M. Endt
Collective effects in Ca(41), by J. B. Raz
Effective interactions and coupling schemes in nuclei, by S. P. Pandya
Angular correlation measurements and properties of P(31), by G. I. Harris
Proton capture reactions in Al(27), by R. Nordhagen
Alpha-capture reactions in trans-neonics, by C. van der Leun
Rotations and vibrations in light nuclei, by J. P. Davidson
Shell model studies in the nuclear (2s, 1d) shell, by M. Harvey
Studies of the giant dipole resonances with proton-gamma ray reactions, by S. S. Hanna.

AD-616 246 Div. 25/2
CFSTI Prices: HC$2.00 MF$0.50

Air Force Cambridge Research Labs., Bedford, Mass.
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
Physical sciences research papers,
by Stanley K. Dickinson, Jr. Apr 65, 37p
Rept. nos. PSRP-98, AFCRL 65-279
Proj. 5621, Task 562101
Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Symmetry(Crystallography), Classification), (*Crystal lattices, Classification), Crystallography, Tables, X-ray diffraction analysis, Crystal structure, Theory.

A scheme for presenting and interpreting the 230 space groups is developed. The scheme is based on the addition of symmetry operations to translation operations in conformance with the symmetry requirements of the seven crystal systems. The stepwise development from crystal systems to space groups is traced in the report and centerfold chart. Complete notes on deciphering the space group symbols and for correlating the Schoenflies and the International systems of abbreviations are included. (Author)

AD-616 258 Div. 25/2, 25/6
CFSTI Prices: HC$2.00 MF$0.50

Metals Research Lab., Brown Univ., Providence, R. I.
GROWTH OF DISLOCATION-FREE GALLIUM CRYSTALS.
Technical note,
by S. H. McFarlane, III and C. Elbaum. Apr 65, 26p
Contract Nonr56227
Unclassified report

Descriptors: (*Gallium, Crystal growth), Metallic crystals, Crystal lattice defects, Physical properties, Crystal lattices, X-rays.

Single crystals of gallium were grown with large portions free of dislocations detectable by anomalous transmission of x-rays. The crystals are grown by an unconstrained solidification technique. The very small supersaturation of vacancies in gallium at room temperature precludes the possibility of vacancy condensation and disc collapse as a mechanism of dislocation formation. Therefore, the absence of dislocations can be explained by the careful growth procedure that minimizes the sources of dislocations usually present during crystal growth. Networks of dislocations can be generated by scratching the surface of the crystal. It is found that the image of a dislocation network at the exit x-ray surface is well resolved while the same network at the entrance x-ray surface produces a completely unresolved image. This effect is attributed to the 'x-ray fan' or x-ray energy spread in the crystal perpendicular to the diffracting planes. (Author)

AD-616 271 Div. 25/8
CFSTI Prices: HC$4.00 MF$0.75

Naval Ordnance Test Station, China Lake, Calif.
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES,
by E. J. Pisa. Dec 64, 103p NOTS-TP-3687
NAVWEPS 8646
Unclassified report

Descriptors: (*Blackbody radiation, Tables), (*Tables, Blackbody radiation), Functions, Partial differential equations.

AD-616 272 Div. 25/3
CFSTI Prices: HC$5.00 MF$1.25

General Applied Science Labs., Inc., Westbury, N. Y.
ELECTROMAGNETIC STUDIES IN SHOCK PRODUCED PLASMAS.
Final rept.,
by R. Tomboulian. 15 Apr 65, 180p
Technical rept. no. TR-519
Contract Nonr347500, Proj. 5246,
ARPA Order 207 62
Unclassified report

Descriptors: (*Plasma medium, Electromagnetic properties), Shock tubes, Shock waves, Electron density, Diffusion, Amplifiers, Valves, Impurities.

A compilation is presented of the important aspects of an analytical and experimental study concerned with non-uniform plasmas. The experimental work was done using a shock tube to produce the plasma. A detailed description of the shock tube facility is presented. A spatially resolving electron density microwave diagnostic technique useful in a range of electron densities infrequently explored by other investigators was developed. This technique permits accurate spatial resolution in plasma gradients for electron densities, orders of magnitude below that possible, using a conventional microwave interferometer. The microwave instrumentation for this technique is described in detail. The analytical formulation correlating the measured properties to ascertain the electron density is shown. A summary is presented of the theoretical work conducted in conjunction with the experimental program. The generalized properties of non-uniform plasmas are given and referenced to the detailed formulations. The diffusion effects in a non-uniform plasma are outlined quantitatively. On the basis of the diffusion calculation, the electromagnetic properties of the plasma contained in the shock tube where radial non-uniformity exists are discussed.

AD-616 291 Div. 25/6, 15/1
CFSTI Prices: HC$2.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y.
FATIGUE FAILURE OF SURFACE FILMS.
Interim technical rept. for 1 Aug-31 Oct 64,
by Y. C. Hsu and F. F. Ling. Apr 65, 49p
Contract AF33 657 10058, Proj. 7342, Task 734204
ML TR-64-397
Unclassified report

Descriptors: (*Films, Surfaces), (*Fatigue(Mechanics), Films), (*Shear stresses, Fatigue(Mechanics)), Failure-

(Mechanics), Elasticity, Loading(Mechanics), Stresses, Mathematical analysis, Integral equations.

For the purpose of correlating the maximum shear stress at the film-substrate interface to the fatigue life of the film the quasi-stationary nature of the shear stress at the interface of a surface layer and the substrate as induced by a load moving at a constant speed along the surface of the layer is investigated. The substrate occupies the half-space. Solutions in integral form, based on the two-dimensional theory of elasticity, are obtained for the shear stress at the interface for the cases of: (a) layer material at subsonic speed; (b) layer material at transonic speed; and (c) layer material at supersonic speed. For all cases, the base material is subsonic. Subsonic and supersonic refer to speeds less than speed of propagation of shear wave and greater than the speed of propagation of dilatational wave, respectively. (Author)

AD-616 297 Div. 20/3
CFSTI Prices: HC$2.00 MF$0.50

Minnesota Univ., Minneapolis. School of Physics.
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963,
by P. S. Freier and C. J. Waddington. May 65, 45p
Technical rept. no. CR-74
Contract Nonr71060

Unclassified report

Descriptors: (*Cosmic rays, Intensity), (*Electrons, Cosmic rays), (*Hydrogen, Cosmic rays), (*Helium, Cosmic rays), (*Protons, Cosmic rays), Nucleons, Energy, Secondary emission, Radiation Measurement systems.

Singly and doubly charged particles in the cosmic radiation were observed during a balloon flight made over Fort Churchill on the 28th July 1963. These particles were detected in nuclear emulsions mounted in a mechanical device which imposed unique temporal resolution between those entering during the balloon ascent and those entering while the balloon floated at ceiling altitude. The integral intensity at the top of the atmosphere of protons having E > 74 MeV was determined to be 2440 ± 160 protons/sq-m ster.sec. while that of helium nuclei having E > 62 MeV per nucleon was 272 ± 13 nuclei/sq.m ster. sec. The differential energy spectra of the protons and helium nuclei have been studied over the energy ranges of 74 MeV < or= E < or= 4 BeV and 62 MeV per nucleon < or= E < or= 1.67 BeV per nucleon respectively. Because of the unprecedented energy range covered in the proton study, it has been possible to compare these particles over a far greater spread of overlapping rigidities than has hitherto been possible. Small numbers of electrons were also observed with results which are in reasonable agreement with those previously reported by other workers. The problem of correcting for secondary electrons appears unresolved, but if ignored, a total intensity of 63 ± 26 electrons/sq.m ster.sec. with 130 < or= E < or= 5 BeV was observed under 2 g/sq.cm of air. (Author)

AD-616 310 Div. 25/3, 30/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
LOW-TEMPERATURE PLASMA GENERATORS,
by S. A. Khristianovich and M. Yu. Zhukov.
14 May 65, 11p FTD-TT-65-63
TT 65-62443

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik, v34 n6 p21-5 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Plasma medium, Generators), (*Energy conversion, Plasma medium), USSR.

AD-616 315 Div. 9/1
CFSTI Prices: HC$1.00 MF$0.50

Army Cold Regions, Research and Engineering Lab., Hanover, N. H.
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE,
by Pieter Hoekstra and R. D. Miller. May 65, 13p Research rept. no. RR-153
Task 1V014501B52A31

Unclassified report

Prepared in cooperation with Cornell Univ., Ithaca, N. Y., under contract DA11 190ENG23.

Descriptors: (*Laminar flow, Water), (*Water, Films), (*Ice, Surface properties), Glass, Soils, Diffusion, Transport properties.

The properties of the film between glass and ice were studied by (1) investigating the influence of particle size on the repulsion and trapping of glass particles by a growing ice surface, and (2) measuring the migration of glass particles embedded in ice. The transport of material in the thin film between the glass and ice is common to both types of experiments. It is assumed that the driving force for the movement of water molecules is proportional to the free-energy gradient. The experimental arrangement and apparatus are described. The process by which glass particles are carried upward by an advancing ice front is shown to be controlled by the transport of water in the film between the glass and the ice. A relationship, derived on the assumption that the transport is by diffusion, predicts the influence of the rate of advance of the ice on the size of the largest particle carried by the ice. The movement rate of particles embedded in ice resulting from a temperature gradient is mainly determined by the thickness of the unfrozen film between the glass and the ice. The thickness of the film decreases rapidly with temperature. (Author)

AD-616 330 Div. 13/10, 13/3, 22/6, 25/6
CFSTI Prices: HC$6.00 MF$1.50

Picatinny Arsenal, Dover, N. J. Engineering Sciences Lab.
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
by E. N. Clark, F. H. Schmitt, D. C. Ellington, I. A. Engle, and S. Nicholaides. May 65, 292p
Contract MIPR33 657 3R/D360, Proj. 6906,
Task 690601
FDL TDR-64-64

Unclassified report

Descriptors: (*Beams(Structural), Deformation), (*Explosion effects, Deformation), (*Structures, Deformation), Aluminum alloys, Steel, Strain(Mechanics), Photographic analysis, Deflection, Test methods, Explosive materials, Calibration, Nuclear explosion effects, Simulation, Plasticity.

An experimental technique of explosively deforming basic structural elements by a precise impulse imparted to the structure. The basic structure in this case is a beam and the impulse is predetermined by the explosive weight. The experiment is monitored by both streak and framing cameras and strain guages. The data when reduced provides deflection modes and deflection time history of the experimental specimen. (Author)

AD-616 338 Div. 25/8
CFSTI Prices: HC$1.00 MF$0.50

Redstone Scientific Information Center, Redstone Arsenal, Ala.
THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPERATURES,
by N. V. Zavaritskii. Apr 65, 9p RSIC-1406
TT 65-62459
Unclassified report

Trans. of Zhurnal Teknicheskoi Fiziki (USSR) v21 n4 p453-7 1951.

Descriptors: (*Thermal properties, Surfaces), (*Heat transfer, Surfaces), (*Metals, Surface properties), Cryogenics, Thermal insulation, Cooling, Thermodynamics.

AD-616 341 Div. 25/6, 25/2, 17/2
CFSTI Prices: HC$2.00 MF$0.50

Engineering Mechanics Research Lab., Univ. of Texas, Austin.
MECHANISM OF FATIGUE IN METALLIC CRYSTALS. Scientific rept.,
by M. A. Wilkov and R. Shield. Jan 65, 39p
EMRL=RM-1003
Grant AF AFOSR560 64
Unclassified report

Descriptors: (*Fatigue(Mechanics), Metallic crystals), (*Aluminum, Single crystals), (*Single crystals, Fatigue-(Mechanics), Cryogenics, Low temperature research, Fracture(Mechanics), Electron microscopy, Surface properties, Crystal lattices, Crystal lattice defects.

The origin and progressive growth of cracks on the surface of (112) and 123) oriented single crystals of aluminum subjected to cyclic deformation at 77K and 300 K were observed with a JEM 150 electron microscope. A negative carbon platinum replication technique was used which allowed a successive examination of the surface changes in a selected area on the surface of a specimen at given intervals of load application. Changes in crystallographic orientation or temperature did not appear to have any effect on the basic mode of crack formation, only the density and rate of crack growth. A tentative explanation of the mechanism of fatigue is proposed based on this work and other previous investigations. (Author)

AD-616 343 Div. 25/4
CFSTI Prices: HC$2.00 MF$0.50

Graduate Research Center of the Southwest, Dallas, Tex.
MIE SCATTERING AND ABSORPTION CROSS SECTIONS FOR ABSORBING PARTICLES,
by Gilbert N. Plass. May 65, 32p
Contract AF19 628 5039; Grant NsG269 62
Unclassified report

Descriptors: (*Electromagnetic waves, Scattering), (*Absorption, Electromagnetic waves), Refractive index, Light, Particles, Particle size, Resonance, Atmospheric refraction, Planetary atmospheres, Interstellar matter.

The Mie scattering and absorption cross sections for spherical particles are calculated as a function of the complex index of refraction, n = n sub 1 -in sub 2. Curves of the efficiency factors for absorption, scattering, and extinction are given for n sub 1 = 1.01, 1.33, 1.5, 2 and for n sub 2 = 0.0001, 0.01, 0.1, 1, and 10. The influence of the absorption on the efficiency factors is discussed. The results are compared with previously proposed simplified expressions for these factors. The variation of the scattered intensity with angle as n sub 2 is varied is illustrated in some typical cases. Finally the influence of n sub 2 on the narrow resonances which occur for large values of n sub 1 is discussed. (Author)

AD-616 345 Div. 13/4, 15/1
CFSTI Prices: HC$3.00 MF$0.75

Battelle Memorial Inst., Geneva (Switzerland).
METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS,
by N. W. Bazley and D. W. Fox. Mar 65, 76p
Contract AF61 052 709, Proj. 7071, Task 707103
ARL 65-46
Unclassified report

Prepared in cooperation with Johns Hopkins Univ., Silver Spring, Md.

Descriptors: (*Beams(Structural), Vibration), (*Elasticity, Beams(Structural)), Numerical methods and procedures, Differential equations, Calculus of variations, Inequalities.

Several methods are developed for the calculation of rigorous lower bounds for the frequencies of continuous linear elastic systems in free vibration. The procedures are applied to obtain numerical bounds for problems arising in beam theory. (Author)

AD-616 350 Div. 25/6, 25/2, 8/2
CFSTI Prices: HC$2.00 MF$0.50

General Electric Research Lab., Schenectady, N. Y.
NEW SOLID-STATE DEVICE CONCEPTS,
by M. Aven, R. O. Carlson, R. S. Ehle, R. N. Hall, and H. H. Woodbury. Apr 65, 39p
Scientific rept. no. SR-1, 65-GC-0304G
Contract AF19 628 4976, Proj. 4608, Task 460805
AFCRL 65-296
Unclassified report

Descriptors: (*Semiconductors, Materials), (*Cadmium compounds, Sulfides), (*Zinc compounds, Optical properties), (*Semiconducting films, Physical properties), Silver, Diffusion, Solubility, Impurities, Selenides, Tellurides, Crystals, Absorption spectrum, Luminescence, Electroluminescence, Emissivity, Reflection, Electrical properties, Gallium alloys, Arsenic alloys, Metal films.

The solubility of Ag in CdS was measured between 375 and 900C and the results are interpreted to indicate at least two and probably three different forms of Ag in CdS. Diffusion profiles were obtained between 300 and 500C. The rate of diffusion of Ag shows a strong concentration dependence and is extremely rapid for dilute Ag concentrations. The profiles are discussed in terms of three independent steps in the incorporation of Ag in CdS. Optical absorption of ZnSe-x Te1-x crystals in the band edge region and their emission characteristics under photoluminescent and electroluminescent excitation were examined. The existence of a minimum in the band gap-composition relationship was confirmed. Considerable broadening of the band edge properties was observed in both absorption and emission for the composition range of $0.09 < x < or = 0.90$. P-n junctions fabricated from ZnSe0.36 Te0.64 crystals demonstrated external quantum efficiencies of 2.4% with the major peak of the electroluminescence spectrum at 2.0 ev. The internal reflectivities and electrical properties of Ag, Cu, Au, Al, Rh, and Ni films deposited by evaporation upon single crystals of GaAs were studied. (Author)

AD-616 353 Div. 25/8, 25/3
CFSTI Prices: HC$3.00 MF$0.75

Northrop Space Labs., Hawthorne, Calif.
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
Interim technical rept.,
by H. N. Olsen, C. D. Maldonado, A. P. Caron, and L. R. Dawson. Mar 65, 71p
Rept. no. NSL-64-356
Contract AF33 615 1105, Proj. 7063, Task 7063 03
ARL 65-48

Unclassified report

Descriptors: (*Plasma medium, Thermodynamics), Magnetic fields, Plasma jets, Electric arcs, Line spectrum, Enthalpy, Argon, Series, Ionization.

The free-burning D.C. electric arc and plasma jet operating in argon at atmospheric pressure were accurately calibrated and compared with independent measurements made in other laboratories. These plasmas which constitute the basic components of a Lorentz force plasma accelerator were interacted to provide a general concept of the distorted plasma geometry to be encountered in a future basic research program aimed at the investigation of interacting plasmas in an external magnetic field. Because of the lack of circular symmetry in the interacting system of plasmas, new analytical methods were developed for converting externally measured integrated spectral line intensities to emission coefficients, a required step in the process of determining plasma temperatures. Theoretical consideration was also given to the effect of nonequilibrium on measured spectral line emission coefficients and the possibility of experimentally detecting any existing difference between electron and heavy particle temperatures. The effect of this nonequilibrium on gas density and static enthalpy was included. (Author)

AD-616 354 Div. 25/3, 9/6
CFSTI Prices: HC$3.00 MF$0.75

Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
VARIABLE CONDUCTIVITY MFD COUETTE FLOW,
by Kenneth R. Cramer. Jan 65, 60p ARL 65-13
Proj. 7063, Task 7063 03

Unclassified report

Descriptors: (*Couette flow, Electrical conductance), (*Electrical conductance, Couette flow), (*Magnetohydrodynamics, Couette flow), Graphics, Analysis of variance, Shear stresses, Fluid dynamic properties, Separation, Temperature.

Couette flow of a conducting fluid subjected to magnetic and electrical fields is examined for several continuous and discontinuous electrical conductivity profiles to estimate the importance of nonuniform conductivity on the fluid-dynamic variables. The velocity field, flow rate and shear at the moving surface are moderately changed and the shear at the stationary surface is greatly increased as the conductivity becomes more nonuniform. For a given profile, only minor differences occur when less than a fourth of the fluid is nonconducting. The separation pressure can be significantly increased by an external electrical field even when a large portion of the fluid is nonconducting. Stronger magnetic and electrical fields magnify the influence of nonuniform conductivity. Major errors may occur from the assumption of uniform electrical conductivity. (Author)

AD-616 387 Div. 25/3, 25/8
CFSTI Prices: HC$3.00 MF$0.75

George Washington Univ., Washington, D. C.
School of Engineering and Applied Science.
THERMAL PORTS IN LINEAR NETWORK THEORY,
by D. K. Anand and Louis de Pian. May 65, 98p
Rept. no. 3
Contract Nonr76109, Proj. NR185 550

Unclassified report

Descriptors: (*Thermoelectricity, Transducers), (*Transducers, Thermoelectricity), Networks, Theory.

Networks involving mechanical and electrical energy have been previously analyzed from a port parameter viewpoint but without considering thermal energy. This dissertation presents an analytical study to consider thermal ports in networks. Onsager's equations are integrated and rewritten as port equations similar to immittance formalism. The port parameters resulting from Onsager's equations are found to be restrictive for general application to an electrical-thermal transducer. The concept of scattering matrices is applied to thermal ports and a set of equations is obtained. It is found that the scattering parameters are functions of the physical properties of the device and the biasing conditions. The scattering parameters are evaluated for static and dynamic operation. Signal power gain is considered and a criterion for passivity and activity is obtained. It is concluded that thermal ports can be considered in network theory provided that the scattering matrix technique is used. Furthermore, linear operation around the quiescent point must be assumed. (Author)

AD-616 398 Div. 25/3, 7/5
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ON ONE-DIMENSIONAL INVISCID MAGNETOHYDRODYNAMIC FLOW.
Revised ed.,
by J. D. Cole and J. H. Huth. 28 Dec 59, 19p
Rept. no. P-1827

Unclassified report

Revision of manuscript dated 15 Oct 59.
Available copy will not permit fully legible reproduction.
Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Magnetohydrodynamics, One-dimensional flow), Incompressible flow, Magnetic fields, Gas flow, Electric fields, Enthalpy, Specific heat.

The one-dimensional steady flow of a compressible inviscid conducting gas through a transverse magnetic field is characterized by a single non-dimensional plot, independent of conductivity. The coordinates are the magnetic field strength and the fluid flow velocity; parameters which characterize events are the entrance Mach number, constant electric field, and the ratio of magnetic energy density to initial flow kinetic-energy density (the magnetic pressure number). (Author)

21. Propulsion and Fuels

AD-615 782 Div. 27/3, 26/1
CFSTI Prices: HC$3.00 MF$0.50

ASTRO, Van Nuys, Calif.
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
Quarterly progress rept. no. 2, 1 Feb-30 Apr 65,
by J. E. Ahern, G. A. Yankura, A. R. Nagy, Jr., and D. R. Ayres. May 65, 52p Rept. no. 25,165
Contract AF04 611 10387
Unclassified report

See also AD-611 801.

Descriptors: (*Film cooling, Rocket motor nozzles), (*Rocket motor nozzles, Film cooling), Filament wound construction, Design, Manufacturing methods, Coolants, Diffusion bonding, Thermocouples, Aluminum alloys, Copper alloys, Tantalum, Performance (Engineering), Digital computers, Programming (Computers), Feasibility studies, Mathematical analysis.

The program consists of an analytical and experimental evaluation of the cooling capability of a nozzle design made by the spiral-wound-nozzle method. The following work was accomplished: (1) The analytical study was completed and all equations and methods of solution were selected. The digital computer program was completed and study cases are being run off on the IBM 7094 for evaluating the program characteristics. (2) The laboratory bench test work on evaluation of thermocouple techniques was completed. The single wire thermocouple approach was shown to be very satisfactory for measurement of the wall temperatures during transpiration cooling. (3) A preliminary blockage study run was completed which indicated that the grooved ribbon design offers promise of satisfactorily operating with coolants having contaminating particles, without catastrophic blockage. (4) Preliminary performances test data were obtained in the laboratory bench test program with aluminum and copper test samples. (Author)

AD-615 798 Div. 10/7, 10/4, 10/5
CFSTI Prices: HC$3.00 MF$0.75

Rocketdyne, Canoga Park, Calif.
STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART I. EXPERIMENTAL INVESTIGATION,
by L. P. Combs and F. W. Hoehn. Jun 64, 60p
Research rept. no. RR-64-24
Contract AF49 638 817
AFOSR 64-1952
Unclassified report

Descriptors: (*Rocket propellants, Combustion), (*Hydrogen, Combustion), (*Oxygen, Combustion), (*Combustion, Rocket propellants), Liquefied gases, Liquid rocket propellants, Gaseous rocket propellants, Combustion chambers, Fuel injectors, Photographic analysis.

Combustion of gaseous hydrogen and liquid oxygen was studied experimentally under rocket conditions in an uncooled transparent-walled two-dimensional combustion chamber which simulated a 1-inch-wide diametrical section of a conventional cylindrical rocket combustor. Tests were made with three injector types using hydrogen chilled to simulate regenerative rocket engine injection temperatures. Photographic data were obtained which yielded considerable qualitative insight and quantitative information concerning the propellant combustion processes. (Author)

AD-615 816 Div. 10/6, 10/7
CFSTI Prices: HC$2.00 MF$0.50

Jet Propulsion Center, Purdue Univ., Lafayette, Ind.
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
Final rept.,
by J. R. Osborn, R. J. Burick, and R. F. Panella.
Jul 64, 34p Rept. no. F-64-3, JPC-386
Grant AF AFOSR207 63 Unclassified report

Descriptors: (*Solid rocket propellants, Burning rate), (*Burning rate, Test equipment), Positioning devices(Machinery), Servomechanisms, Rocket motors-(Solid propellant), Models(Simulations), Scintillation counters, Transducers, Combustion chambers.

An experimental apparatus was developed for the direct and continuous measurement of the burning rates of solid rocket propellants under conditions closely approximating those occurring in a solid rocket motor. The apparatus utilizes a positioning type servomechanism as a feed system which moves a sample of solid propellant within a two-dimensional rocket motor so that the receding burning surface of the sample is maintained at a fixed position with respect to the motor walls. Because the burning surface is maintained at a fixed position; the measurement of the velocity of the propellant feed system is identical with the burning rate. The servomechanism incorporates a 50 millicurie Cesium-137 source of gamma rays coupled with a scintillation probe for detecting the position of the burning propellant surface. Experimental data were obtained with the above servomechanism for two composite propellant formulations, for combustion pressures ranging from 125 to 505 psia, and for burning rates ranging from 0.16 to 0.33 in/sec. The data correlated well with previously published data. A theoretical analysis of the servomechanism was performed for determining the stability and performance of the system. An optimization analysis of the servomechanism system yielded the optimum operating parameters. (Author)

AD-615 894 Div. 12/3, 10/4, 10/5, 27/3

Ballistic Systems Div., Norton AFB, Calif.
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
Revision C.
5 Mar 62, 14p BSD-Exhibit-61-3C
Unclassified report

Revision C supersedes all previous issues. Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Rocket propellants, Standards), (*Liquefied gases, Standards), (*Oxygen, Standards), (*Nitrogen, Standards), (*Air, Standards), (*Helium, Standards), Contamination, Fuel systems, Handling, Particles, Fibers, Test methods, Hydrocarbons, Storage.

The purpose of the report is to establish a document for incorporation into Air Force Ballistic Missile program contracts which will provide a standard exhibit outlining the cleanliness criteria, and inspection procedures to assure the desired cleanliness level of components and systems handling liquid oxygen, liquid nitrogen, gaseous nitrogen, helium and RP-1 fuel utilized in ballistic missiles. (Author)

AD-615 931 Div. 10/6, 27/3
CFSTI Prices: HC$1.00 MF$0.50

Catholic Univ. of America, Washington, D. C. Stress

Analysis Lab.
AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
Progress rept. no. 2,
by A. J. Durelli and V. J. Parks. May 65, 6p
Contract AF04 611 10378, Proj. 4 142 000 02
Unclassified report

See also AD-614 656.

Descriptors: (*Rocket propellant grains, Surface properties), (*Rocket cases, Solid rocket propellants), (*Solid rocket propellants, Stresses), Bonding, Rubber, Models(Simulations), Photoelasticity, Photographic analysis, Deformation, Simulation, Epoxy plastics, Model tests.

Tests are reported which show that, using the bonding knife-edged technique, the same distributions of stresses can be obtained in a rectangular two-dimensional rubber plate bonded to a metal strip, as in the central plane of a square slab with the same ratio of height to length as the rubber specimen. (Author)

AD-615 985 Div. 10/7
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
PULSATING COMBUSTION OF GAS BEHIND A SHOCK WAVE IN SUPERSONIC FLOW,
by R. I. Soloukhin. 13 May 65, 8p FTD-TT-65-32
TT 65-62411
Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n6 p57-60 1961. Available copy will not permit fully legible reproduction.

Descriptors: (*Combustion, Gases), Ignition, Shock waves, Supersonic flow, Detonations, USSR.

In the experiments described a shock tube was used to obtain a stream of mixture, in which the temperature behind the front of direct densification jump at the surface of the decelerating body is sufficient for adiabatic spontaneous combustion of the gas. The condition of periodic ignition of the gas behind the disconnected shock wave was investigated.

AD-616 098 Div. 10/6, 10/7, 27/3
CFSTI Prices: HC$3.00 MF$0.75

Jet Propulsion Center, Purdue Univ., Lafayette, Ind.
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
Annual rept.,
by J. R. Osborn, R. J. Burick, and P. Y. Ho. Feb 65, 58p
Rept. nos. I-65-2, JPC-405
Grant AF AFOSR207 64
Unclassified report

Descriptors: (*Solid rocket propellants, Burning rate), (*Burning rate, Test equipment), Servomechanisms, Rocket motors(Solid propellant), Models(Simulations), Radiation measurement systems, Combustion chamber gases, Microwaves, Attenuation, Probes(Electromagnetic), Transducers, Ultrasonic radiation, Acoustic impedance, Acoustic equipment, Combustion, Measurement.

The basic operating principles of an experimental system for the direct and continuous measurement of solid propellant burning rates are presented. The system was designed and fabricated. A continuous burning rate measurement technique, termed the Servo-mechanism Technique, will be employed for obtaining erosive burning rate data for types BDI and BUU double-base propellants. A feasibility study was conducted for determining the adaptability of microwave techniques to the measurement of the burning rate of a solid propellant. It was concluded, because of the dependence of the microwave attenuation upon the combustion conditions present in a research rocket motor, that microwave techniques are not readily adaptable to such burning rate measurements. A feasibility study indicates that a technique employing ultrasonic pulses can be developed for obtaining direct measurements of the burning rate of a solid propellant. The technique is based on measuring the time for an ultrasonic pulse to travel through a propellant sample. (Author)

AD-616 129 Div. 27/3, 10/5, 10/7
CFSTI Prices: HC$4.00 MF$1.00

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID-PROPELLANT ROCKET ENGINE,
by A. V. Bolgarskii. Oct 59, 122p F-TS-9547
TT 60-15471
Unclassified report

Trans. of mono. Raschet Protsessov v Kamere Sgoraniya i Sople Zhidkostnogo Raketnogo Dvigatelya, Moscow, 1957.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Rocket motors(Liquid propellant), Performance(Engineering)), (*Combustion chambers, Thermodynamics), (*Rocket motor nozzles, Thermodynamics), Liquid rocket propellants, Combustion, Density, Liquid rocket oxidizers, Combustion chamber gases, Combustion products, Exhaust gases, Thermal properties, Nonequilibrium flow, Numerical analysis, Nomographs, USSR.

The book is devoted to questions of combustion and discharge at high temperatures in a liquid-propellant rocket engine. It gives the detailed technique for the thermodynamic calculation of the working process, illustrated by the solution of a series of practical problems. The book offers the bases for the possibility of applying a graphical method for calculating the parameters of the liquid-propellant rocket engine, which greatly facilitates this calculation. It gives a detailed exposition of the technique of constructing such nomograms. Two nomograms for two types of propellant, constructed by the author, are appended at the end of the book. (Author)

AD-616 143 Div. 10/7, 10/6

Naval Ordnance Test Station, China Lake, Calif.
STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION,
by Charles M. Drew, Alvin S. Gordon, and R. H. Knipe. 1964, 25p NOTS-TP-3763
Task RMMP22 094 216 1R001 06 01
NAVWEPS 8717
Unclassified report

Pub. in Progress in Astronautics and Aeronautics v15 p17-39 1964 (Copies not available to DDC or Clearinghouse customers).
Presented as Preprint 63-487 at the AIAA Heterogeneous Combustion Conference, Palm Beach, Fla., 11-13 Dec 63.

Descriptors: (*Solid rocket propellants, Combustion),

(*Aluminum, Combustion), (*Fuel additives, Aluminum), Particles, Quenching(Inhibition), Flames, Oxygen, Hydrogen, Ignition, Oxides, Spheres, Models(Simulations)

The ignition and burning geometry of aluminum particles in a hydrogen-oxygen flame was investigated. Studies of unquenched and quenched residues reveal new information on burning configuration. Some implications of these findings are presented. (Author)

AD-616 162 Div. 21/5, 25/3

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO-PHASE METAL VAPORS,
by A. W. Rowe and J. L. Kerrebrock. 14 Aug 64, 2p
Contracts DA36 039AMC03200E, AF33 615 1083

Unclassified report

Pub. in A I A A Journal v3 n2 p361-2 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrical conductance, Vapors), (*Alkali metals, Electrical conductance), (*Nuclear propulsion, Magnetohydrodynamics), Rankine cycle, Phase studies, Plasma medium, Potassium, Thermionic emission, Electric propulsion, Electrons, Ionization.

Rankine cycle nuclear-electric power systems, with alkali metal working fluids and MHD generators used in place of turbines, show promise of producing considerably higher powers per unit of system mass than seem possible with turboalternators. A key problem in the development of such systems is the attainment of adequate electric coaductivity in the alkali metals at the temperatures accessible to reactors. An approximate theory of the wet nonequilibrium gas was developed. The results, although tentative, suggest first that nonequilibrium ionization may be difficult to attain in alkali-metal MHD generators with wet vapor used, unless droplet growth can be stimulated; second, electrical techniques such as this one may be useful for study of droplet nucleation and growth; and third, the successful operation of the high-temperature loop is an indication that alkali-metal systems may be operable at somewhat higher temperatures than are now proposed.

AD-616 300 Div. 27/2
CFSTI Prices: HC$4.00 MF$0.75

General Electric Co., West Lynn, Mass.
PROCESSING OF ENGINE DATA FOR DEVELOPMENT OF TURBOJET ENGINE ANALYZER. PART II. PROCESSING OF J79-15 DATA FROM A 500 HOUR CELL TEST.
Final rept.,
by M. E. Douglass. 5 Jan 65, 112p
Contract AF33 657 11043, Proj. 3 7 3147, Task 314703
SEG TDR-64-11 P2

Unclassified report

See also AD-606 033.

Descriptors: (*Turbojet engines, Performance(Engineering)), (*Jet engines, Test methods), Data, Thermodynamics, Analysis, Turbines, Degradation, Tables, Maintenance, Measurement, Compressors, Programming(Computers).

The report describes the results of processing thermodynamic performance sensitive parameters, measured on a 500 hour cell test, of a J79-15 engine to estimate its condition. The results of the cell test confirm the encouragement derived from previous flight test data. Minor deteriorations within the estimated allowable limits were observed on the compressor and turbine measurements, which confirms the inspection findings at the conclusion of the test. More data on more engines is required to establish more firmly that the operation problems in service will be detected by thermodynamic measurements and to define with greater assurance the parameter limits indicative of deterioration requiring maintenance. (Author)

AD-616 312 Div. 10/2, 14/5
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
NEW ADDITIVES TO FUELS AND LUBRICANTS,
by Ya. B. Chertkov. 14 May 65, 11p FTD-TT-65-62
TT 65-62445

Unclassified report

Unedited rough draft trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v7 n3 p64-6 1962.

Descriptors: (*Fuel additives, Reviews), (*Lubricant additives, Reviews), USSR.

A review of the western literature concerning fuel and lubricant-additive developments.

AD-616 317 Div. 10/5, 27/3
CFSTI Prices: HC$1.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
PROPELLANT CONTAINMENT UTILIZING SCREEN MESH AND PERFORATED PLATE SURFACES,
by M. P. Hollister. 29 Dec 64, 18p LMSC-A665481

Unclassified report

Descriptors: (*Liquid rocket propellants, Propellant tanks), Containers, Vapors, Bubbles.

The paper describes a theory and experimental investigation of propellant containment utilizing woven mesh or perforated plate surfaces. A simple theory is presented about which the experimental investigation and data presentation is centered.

AD-616 361 Div. 10/2, 30/5
CFSTI Prices: HC$3.00 MF$0.75

Air Force Aero Propulsion Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio.
A COMPARISON OF THE CAPABILITIES OF A FUEL COKER AND THE MINEX HEAT EXCHANGER FOR DETERMINING HYDROCARBON FUEL THERMAL STABILITY.
Rept. for Jun 63-Oct 64,
by Alan E. Zengel. Mar 65, 99p
APL TR-64-154
Proj. 3048, Task 304801

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Hydrocarbons, Degradation), (*Jet engine fuels, Stability), Pyrolysis, Test equipment, Heaters, Heat exchangers, Films, Heat transfer, Thermal conductivity.

Hydrocarbon jet fuels degrade at high temperatures to leave lacquer-like deposits on hot surfaces. Presently, a fuel's

resistance to thermal degradation is determined by visually rating a color on a tube that has been exposed to hot fuel. Unfortunately, the visual rating is difficult to interpret in terms of such engineering parameters as the effect on heat transfer. In this report, comparisons are made between the visual results obtained with a coker and the results obtained with a small, highly-instrumented Minex heat exchanger. The comparisons show that a reasonable correlation between the results obtained with the heat exchanger and with the coker may be achieved if three or more coker tests are analyzed on the basis of tube wall temperature versus deposit rating. By measuring the thickness of the film deposited and by knowing the effect of this thickness on heat transfer, a thermal conductivity can be calculated. The study showed that the calculated thermal conductivity was essentially the same for all of the seven fuels tested, the average thermal conductivity being 0.05 Btu/(hr)(sq ft)(F/ft). (Author)

22. Space Technology

AD-615 854 Div. 12/6, 12/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CERTAIN PROBLEMS OF OPTIMUM CONTROL OF THREE DIMENSIONAL MOTION OF SPACE VEHICLES,
by R. V. Studnev. 25 May 65, 23p FTD-MT-65-120
TT 65-62377

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 24p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Spacecraft, Control systems), (*Control jets, Spacecraft), Optimization, Motion, Satellite attitude, Rotation, USSR.

There are investigated questions of optimum pulse control of the spatial orientation of an axially symmetric space vehicle (SV). It is assumed that control of the SV is carried out by two pairs of control jets (CJ), one of which is fastened in the vehicle and creates a moment about the axis of symmetry, and the second pair is fixed in a cardan suspension and can create a moment about any axis orthogonal to the axis of symmetry of the apparatus. Optimum control of orientation of the axis of rotation which is the axis of symmetry of the SV is found. Conditions are determined under which control of orientation can be carried out by one pair of CJ fastened in the vehicle. Control is optimized of orientation of the SV rotating about a principal axis of inertia which is not the axis of symmetry. Optimum control of the spatial orientation of an axially symmetric SV is investigated in general. (Author)

AD-615 855 Div. 12/6, 12/2

Foreign Technology Div., Wright-Patterson AFB, Ohio.
CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION,
by G. Yu. Dankov and F. A. Mikhailov. 24 May 65, 14p
FTD-MT-65-121
TT 65-62378

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 13p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Rendezvous spacecraft, Orbital trajectories), (*Space stations, Rendezvous spacecraft), Partial differential equations, Rotation, Motion, USSR.

The problem is considered of spacecraft guidance in the stage of distant approach to an orbital station using the second derivative of relative distance as information about rotation of the line of sight.

AD-615 856 Div. 12/6, 12/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX,
by E. L. Akim, M. L. Kislik, P. E. Elyasberg, and T. M. Eneev. 19 May 65, 22p FTD-MT-65-122
TT 65-62379 Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 8p.

Descriptors: (*Satellites(Artificial), Orbital trajectories), (*Orbital trajectories, Determination), (*Automatic navigators, Orbital trajectories), Automatic transmissions, Celestial mechanics, Computers, USSR.

Orbits of objects in outer space are determined by means of the application of contemporary automatic means of measurements, transmission and processing of data, and the creation of mathematical methods.

AD-615 857 Div. 12/6, 12/2, 15/1
CFSTI Prices: HC$2.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT,
by N. N. Moiseev and V. N. Lebedev. 25 May 65, 28p FTD-MT-65-123
TT 65-62380

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 33p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Spacecraft, Control systems), (*Optimization, Control systems), Orbital trajectories, Circular orbit trajectories, Calculus of variations, Dynamic programming, Boundary value problems, Solar sails, USSR.

Two approaches to the solution of variational problems of control of spacecraft are demonstrated. Problems using the principle of the maximum were discussed, and a very high accuracy of calculations was obtained. However, it requires great expenditure of machine time and requires a good first approximation. All calculations were carried out with very high degree of accuracy and in this sense the given results have a 'final character'. Methods of dynamic programming require a considerably smaller number of 'machine hours.' For their use there is no necessity to have a good first approximation. However, they are inferior to classical methods in the sense of accuracy. Schemes of only the first order of accuracy, equivalent to the scheme of integration of Euler were considered. Only now has there begun systematic investigation of finite difference schemes of higher order of accuracy.

AD-615 858 Div. 12/6, 12/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT,
by A. K. Platonov, A. A. Dashkov, and V. N. Kubasov.
19 May 65, 18p FTD-MT-65-125
TT 65-62381

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 22p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Spacecraft, Control systems), (*Optimization, Control systems), (*Flight control systems, Spacecraft), Space flight, Interplanetary trajectories, USSR.

Properties are investigated of optimum processes of flight control of spacecraft when complete information about motion is available and when control is produced with the purpose of maintaining given values of certain functionals of the trajectory. Such functionals can be parameters of the trajectory characterizing conditions of encounter with a planet or another apparatus in outer space, or parameters determining spatial position of apparatus at a fixed moment of time.

AD-615 859 Div. 12/6, 12/2, 15/1

Foreign Technology Div., Wright-Patterson AFB, Ohio.
PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL,
by V. A. Yaroshevskii. 25 May 65, 22p
FTD-MT-65-126
TT 65-62383

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 28p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Orbital trajectories, Spacecraft), (*Spacecraft, Control systems), (*Mathematical prediction, Orbital trajectories), Perturbation theory, Statistical functions, Probability, Matrix algebra, USSR.

Spacecraft trajectories are predicted using the principle of maximum probability. Perturbations are Gaussian random functions. It is desired to change the controlling action, depending upon measured values, so as to reduce probable deviations of elements of the 'final miss' vector to a minimum.

AD-615 860 Div. 12/6, 12/2, 15/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE,
by V. A. Sarychev. 25 May 65, 17p FTD-MT-65-129
TT 65-62384

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 18p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Satellites(Artificial), Rotation), (*Rotation, Satellites(Artificial)), (*Differential equations, Rotation), Satellite attitude, Circular orbit trajectories, Orbital trajectories, USSR.

The rotation of a satellite whose center of mass moves along a circular orbit.

AD-615 861 Div. 12/6, 12/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
THERMAL NOISE OF MEASURING DEVICES AND LIMITING ACCURACY SELF-CONTAINED GUIDANCE OF A SPACE SHIP,
by A. A. Krasovskii. 25 May 65, 19p
FTD-MT-65-130

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 23p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Inertial guidance, Spacecraft), (*Spacecraft, Inertial guidance), Astronautics, Instrumentation, Noise, Thermal properties, Space flight, Vibration, Theory, Design, Statistical functions, Partial differential equations, USSR.

In this article a theory is developed in reference to open inertial systems, the characteristic peculiarity of which is the single and double integration of signals of primary transducers.

AD-615 862 Div. 12/2, 15/1, 27/3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER,
by V. V. Tokarev. 20 May 65, 15p FTD-MT-65-131
TT 65-62386

Unclassified report

Edited machine trans. of unidentified Russian mono., n.p., 1965, 18p.

Descriptors: (*Thrust, Rocket motors), (*Optimization, Thrust), (*Rocket trajectories, Corrections), Rocket propulsion, Fuel consumption, Payload, Control systems, Motion, Gravity, USSR.

The problem of optimal correction is formulated so that still before realization of the trajectory there are selected optimum, in the mean, weight relationships and optimum programs of rocket acceleration which will ensure maximum of payload on whose delivery it is possible to count on.

AD-615 863 Div. 12/6, 12/1
CFSTI Prices: HC$6.00 MF$1.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
THE UNIVERSE: AN OPEN SEA,
by Valentina Nikolayeva-Tereshkova. 5 Mar 65, 277p
FTD-TT-64-927
TT 65-62387

Unclassified report

Unedited rough draft trans. of mono. Vselennaya: Otkrytyi Okean, Moscow, 1964, 198p.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Astronauts, Females), (*USSR, Astronauts), Space flight, Manned spacecraft, Astronautics.

AD-615 874 Div. 12/1, 2/1, 2/6
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE,
by L. D. Nikolenko. 7 May 65, 8p FTD-TT-65-11
TT 65-62400

Unclassified report

Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Dopovidi n6 p745-8 1964.

See also AD-270 873.

Descriptors: (*Satellites(Artificial), Orbital trajectories), (*Earth, Geophysics), (*Orbital trajectories, Satellites-(Artificial), Gravity, Space flight, Differential equations, Harmonic analysis, Nonlinear systems, Spheres, USSR.

The results are presented of analytical investigation of the motion of an artificial satellite in a non-central field of gravity of the earth. An approximate solution of the problem is obtained by the averaging method of N. M. Krylov and N. N. Bogolyubov (Asymptotic methods in the theory of nonlinear oscillations. Fizmatgiz, 1958). (Author)

AD-615 925 Div. 12/6, 12/1, 20/3
CFSTI Prices: HC$2.00 MF$0.50

United Nuclear Corp., White Plains, N. Y. Development Div.
GAMMA SCANNING OF SATAR SATELLITE WL-412.
Final rept. for 1 Dec 64-15 Mar 65,
by G. Foster. May 65, 44p UNC-5108
Contract AF29 601 6685, Proj. 8803
WL TR-65-35

Unclassified report

Descriptors: (*Satellites(Artificial), Radiation measurement systems), (*Radiation measurement systems, Satellites(Artificial)), (*Protons, Radiation measurement systems), Gamma rays, Scanning, Monitors, Computers, Penetration, Cylindrical bodies, Electrons, Density, Mathematical analysis, Tables.

The gamma probe technique developed by UNC has been used to determine the areal electron density distribution about detector positions for Tissue Equivalent Ion Chambers (T.E.I.C.) and Linear Energy Transfer detectors (L.E.T) in the SATAR Satellite WL-412. The results of the survey have been used to calculate a proton dose of 2.3 X 10 to the minus 7th power rad/unit flux at detector position No. 4, produced by the Vette (f sub 1 V) proton spectrum. The results for the remainder of the points (in the form of tables of solid angle as a function of areal electron density) and the proton dose calculational technique are supplied in order that the dose calculation may be performed for other points if desired. The detailed electron density distributions and corresponding solid angle tables in the form of computer printouts are transmitted under separate cover. (Author)

AD-615 986 Div. 12/6, 12/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
LABORATORIES IN SPACE,
by S. Vernov. 14 May 65, 7p
FTD-TT-64-1361
TT 65-62412

Unclassified report

Unedited rough draft trans. from Izvestiya (USSR) 15 Jul p6 1964.

Descriptors: (*Scientific satellites, USSR), (*Satellites-(Artificial), USSR), Space environmental conditions, Orbital trajectories, Charged particles, Magnetic fields, Aurorae, Ionosphere, Van Allen radiation belt.

AD-615 988 Div. 12/1
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
AN EXPLOIT WHICH HUMANITY WILL NOT FORGET. FROM THE LOGBOOKS OF FLIERS-COSMONAUTS V. BYKOVSKII AND V. TERESHKOVA,
by F. Lushnikov. 7 May 65, 15p
FTD-TT-64-1379
TT 65-62414

Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) 14 Dec p3-4 1963.

Descriptors: (*Space flight, Reports), (*Astronauts, USSR), Space environmental conditions.

Translations of excerpts from the logbooks kept by the Russian astronauts Lt. Col. V. Bykovskiy and the woman, Valya Tereshkova, during their 1963 flights in VOSTOK 5 and VOSTOK 6.

AD-616 118 Div. 12/6, 12/1
CFSTI Prices: HC$3.00 MF$0.75

Naval Ordnance Test Station, China Lake, Calif.
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
Rept. for Mar 60-Mar 63,
by H. L. Newkirk. Jun 65, 81p NOTS-TP-3520
Task RMM042 008 216 1F008 09 001
NAVWEPS 8525

Unclassified report

Descriptors: (*Scientific satellites, Stability), (*Rotation, Damping), Launching, Atmosphere, Dynamics, Spin, Reliability, Design.

A reliable passive device was developed for quickly damping out nutational motion of the spin-stabilized NASA S-6 satellite (Explorer 17). The operating principles for this twin-pendulum damper were determined with the aid of a small table-top gyroscopic model. Final developmental testing was done with a full-scale dynamical simulator. Formulas for each of the three basic design criteria are derived. These formulas are (1) for tuning the damper to the nutational disturbance, (2) for the selection of the viscous friction coefficient of the pendulum hinge, and (3) for the guarantee that the desired final balanced and stable configuration of damper and satellite will be obtained. (Author)

AD-616 156 Div. 12/6, 12/1, 25/8

Lockheed Missiles and Space Co., Sunnyvale, Calif.
A SIMPLE NUMERICAL SOLUTION FOR HEAT CONDUCTION IN A SOLID WITH A RECEDING SURFACE,
by J. J. Brogan. 20 Aug 64, 2p

Unclassified report

Pub. in Journal of Spacecraft and Rockets v2 n1 p112-3 Jan-Feb 1965 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript received 22 Jun 64.

Descriptors: (*Spacecraft, Cooling), (*Thermal conductivity, Numerical methods and procedures), Atmosphere entry, Reentry vehicles, Ablation, Theory, Infrared detectors, Sublimation.

Recent interest in use of sublimation for cooling infrared detectors to cryogenic temperatures, and continued use of the ablation concept for thermal protection of re-entry vehicles, requires an accurate yet simple method of solution to problems of heat conduction in solids with a receding surface. General analytical solutions are not available and exact solutions are known only for the special cases. A simple numer-

ical method of solution is described, and results of its application are presented in this note. The advantages of the present numerical method over others are the simplicity of its formulation and the ease of computation. Use of the present method permits 1) versatility in the selection of boundary conditions, e.g., a time-dependent moving boundary temperature can be incorporated easily and 2) computation without necessarily resorting to digital or analog computers. (Author)

AD-616 282 Div. 12/6, 12/1
CFSTI Prices: HC$2.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
OPTIMUM TWO-PULSE PASSAGE BETWEEN ORBITS WITH SMALL INCLINATIONS AND ECCENTRICITIES,
by V. S. Novoselov. 15 May 65, 26p
FTD-TT-65-64
TT 65-62438

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Institut Teoreticheskoi Astronomii. Byulleten v9 n5 p295-309 1963.

Descriptors: (*Space flight, Optimization), (*Interplanetary trajectories, Optimization), Calculus of variations, Celestial mechanics, Transfer trajectories, USSR.

An analytical formulation is given of the trajectory of an optimum two-pulse flight between orbits with small inclinations and eccentricities. (Author)

AD-616 307 Div. 12/6, 12/1, 24/2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.
ARRANGEMENT FOR PHOTOGRAPHING ARTIFICIAL EARTH SATELLITES,
by M. K. Abele and K. K. Lapushka. 14 May 65, 8p FTD-TT-65-205
TT 65-62440

Unclassified report

Unedited rough draft trans. of Patent (USSR) 162 748, appl. no. 812508/26-10, 9 Jan 63.

Descriptors: (*Satellites(Artificial), Photography), Cameras, Tracking, Telescopes, Photographic equipment, Transducers, Capacitors, Patents, USSR.

The device for photographing artificial earth satellites containing blocks for controlling film drive and the angular position of the camera is distinguished by utilization of a controlled telescope-guide which continually tracks the satellite and serves for visual control of compensation of the visible angular velocity.

AD-616 383 Div. 12/3
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
MEASURING MISSILE RELIABILITY IN PRE-LAUNCH ENVIRONMENTS.
Revised ed.,
by David S. Stoller. 9 May 60, 22p Rept. no. P-1810

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Revision of manuscript submitted 30 Oct 59.

Descriptors: (*Guided missiles, Launching), (*Launching, Checkout procedures), Reliability, Costs, Weapon systems, Measurement, Data, Probability, Checkout equipment, Quality control, Effectiveness, Maintenance, Performance(Engineering).

The paper examines some of the problems involved in measuring missile reliability during its pre-launch phase. This is an important problem for three reasons: (1) a missile typically is exposed to many kinds of operating environments over long periods of time before it is launched; (2) a missile's reliability history in its pre-launch operating environments is an index of its in-flight reliability; and (3) the major cost of a missile weapon system derives from the consequences of its pre-launch reliability behavior.

AD-616 402 Div. 12/6, 12/2, 30/4
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
MANNED CONTROL OF ORBITAL RENDEZVOUS,
by E. Levin and J. Ward. 20 Oct 59, 17p
Rept. no. P-1834

Unclassified report

Prepared for presentation at the National Symposium on Manned Space Stations, 20-22 Apr 60, Ambassador Hotel, Los Angeles. A condensed version is to be published by Astronautical Sciences Review. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Manned spacecraft, Control), (*Rendezvous trajectories, Simulation), (*Spacecraft docking, Flight simulators), (*Flight simulators, Spacecraft docking), Rendezvous spacecraft, Control panels, Display systems, Fuel consumption, Astronauts, Training devices.

A device was assembled at The RAND Corporation to simulate the in-plane response of an orbiting space vehicle to applied thrusts. This simulator was used to study manned control of an orbital rendezvous maneuver. It was found that a pilot with appropriate display and controls could direct the extreme terminal portion of the rendezvous maneuver with great precision and flexibility. The fuel consumed during this 'docking' phase of the operation was a very small fraction of the total fuel required to rendezvous and consequently the comparative efficiency of a pilot and an automatic system was not regarded as a major consideration. It was also found that with training a pilot could successfully direct a rendezvous maneuver from large distances. However, properly designed automatic equipment would be significantly more efficient for this phase of the operation and it was concluded, therefore that the pilot's role in the distant closing phase of the rendezvous operation would be limited to override in case of equipment malfunction or in the event that an unusual maneuver seemed necessary. The use of a pilot appeared to be highly desirable for the extreme terminal phase of rendezvous where local decisions and fine vernier corrections might be required. (Author)

AD-616 407 Div. 12/6, 12/1, 2/1

RAND Corp., Santa Monica, Calif.
VEHICLES FOR EXPLORATION ON MARS,
by T. F. Cartaino. 29 Oct 59, 20p Rept. no. P-1841

Unclassified report

Prepared for presentation at American Rocket Society Space Vehicles Conference, Santa Barbara, Calif,

6-8 Apr 60
Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Mars, Manned spacecraft), (*Manned spacecraft, Mars), Planetary atmospheres, Exploration, Extraterrestrial bases, Terrain, Exploration, Mars probes, Rocket propulsion, Rocket propellants, Space environmental conditions, Pressure suits, Feasibility studies, Tables, Design.

A discussion is presented on the kinds of vehicles which might be employed for extensive exploration on Mars after landings by manned expeditions. This preliminary look is intended to answer questions concerning the feasibility of designing such vehicles; however, little effort is made to answer questions concerning the desirability of these vehicles when considered within the context of total expedition requirements. (For example, Martian orbital rendezvous vehicles might be of dual or of multi-purpose design.) The preliminary nature of the discussion is stressed. (Author)

AD-616 419 Div. 12/6, 12/1, 7/5

RAND Corp., Santa Monica, Calif.
SPACE VEHICLE POWER PLANTS,
by J. H. Huth. 22 Dec 59, 75p Rept. no. P-1861
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Spacecraft, Power supplies), (*Power supplies, Spacecraft), Energy conversion, Batteries + components, Solar cells, Nuclear power plants, Spaceborne, Magnetohydrodynamics, Electrostatics, Space environmental conditions.

A review is given of the possibility of using chemical units, solar-powered units, nuclear power systems, and special devices as power sources in space vehicles. Special attention is given to the effects of the space environment on power systems.

AD-616 422 Div. 12/6, 12/2

RAND Corp., Santa Monica, Calif.
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS,
by T. B. Garber. 1 Dec 59, 25p Rept. no. P-1864
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
Prepared for presentation at the National Symposium on Manned Space Stations on April 20-22, 1960.

Descriptors: (*Rendezvous guidance, Ascent trajectories), (*Ascent trajectories, Tendezvous guidance), (*Rendezvous trajectories, Terminal guidance), Rendezvous spacecraft, Space stations, Guidance, Guided missile trajectories, Geometry, Differential equations.

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and division number. A typical subject index entry is shown below.

*COMBUSTION
OSCILLATION
INTENTIONAL COMBUSTION
OSCILLATIONS IN PROPULSION
SYSTEMS
AD-608 206 DIV. 25

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Division numbers and titles are also listed. Again, three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*BENDAT, JULIUS S.
* * *
ZERO CROSSINGS OF A SINE
WAVE PLUS RANDOM NOISE
AD-608 019 DIV. 15
* * *
SPECTRA AND AUTOCORRELATION
FUNCTIONS FOR FULLY DEVELOPED
SEAS AND PREDICTION OF STRUCTURAL
FATIGUE DAMAGE
AD-608 464 DIV. 2

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry (designated by an asterisk) for each document are listed the originator of the report, the originator's report number, the title, AD number, and division number. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parantheses directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

*SHEFFIELD UNIV (ENGLAND)
* * *
HIC 45
INTENTIONAL COMBUSTION
OSCILLATIONS IN PROPULSION
SYSTEMS.
(AFOSR 64 2029)
AD-608 206 DIV. 25

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C
* * *
64 2029
INTENTIONAL COMBUSTION
OSCILLATIONS IN PROPULSION
SYSTEMS.
AD-608 206 DIV. 25

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and division number.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 500
LINCOLN LAB MASS INST OF TECH
LEXINGTON
LL TR 365
(ESD TDR64 378)
AD-608 272 DIV. 30
LL 1964 63
(ESD TDR64 566)
AD-608 288 DIV. 8

AD-DIVISION INDEX

The AD-Division Index is arranged numerically by AD number and lists the subject division where the full entry can be located in TAB.

SUBJECT INDEX

The fields indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

•ABDOMEN
RUPTURE
REPRINT: FEMORAL HERNIA IN CHILDREN.
AD-616 159 FLD. 6

•ABSORPTION
CARBON DIOXIDE
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 1. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS.
AD-615 771 FLD. 13

ELECTROMAGNETIC WAVES
MIE SCATTERING AND ABSORPTION CROSS SECTIONS FOR ABSORBING PARTICLES.
AD-616 343 FLD. 20

•ACCLIMATIZATION
HEAT TOLERANCE
REPRINT: TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN.
AD-616 169 FLD. 6
REPRINT: EFFECTS OF OVERHYD RATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT.
AD-616 169 FLD. 6

•ACOUSTIC DETECTORS
CORRELATORS
REPRINT: EFFECT OF NOISE CROSSCORRELATION ON BINAURAL SIGNAL DETECTION.
AD-615 830 FLD. 17
REPRINT: OPTICAL-CORRELATION DETECTOR FOR THE AUDIO FREQUENCY RANGE.
AD-616 065 FLD. 17

GRAPHITE
GRAPHITE MONOPARTICULATE LAYER TRANSDUCER FOR DETECTING SOUND VIBRATIONS.
AD-616 100 FLD. 9

•ACOUSTIC IMPEDANCE
SONAR EQUIPMENT
EFFECT OF THEVENIN EQUIVALENT INTERNAL IMPEDANCE ON VELOCITY CONTROL AND ACOUSTIC POWER FOR PLANAR BROADSIDE ARRAYS FOR DIFFERENT DRIVING LEVEL LIMITATIONS.
AD-615 773 FLD. 17

•ACRYLIC RESINS
PYROLYSIS
REPRINT: LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 892 FLD. 11

•ACRYLONITRILE POLYMERS
CATALYSIS
TRANSLATION OF RUSSIAN TRANSLATION: CATALYSIS ON AN ORGANIC SEMICONDUCTOR MADE FROM POLYACRYLONITRILE.
AD-615 989 FLD. 7

FIBERS(SYNTHETIC)
TRANSLATION OF RUSSIAN RESEARCH ON POLYACRYLONITRILE AND POLYAMIDE FIBERS FROM 'CHEMICAL FIBERS,' 1963, NO. 6.
AD-615 982 FLD. 11

•ADDITIVES
CHROMATOGRAPHIC ANALYSIS
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS LIQUID CHROMATOGRAPHY.
AD-615 955 FLD. 7

•ADENOSINE PHOSPHATES
ANOXIA
REPRINT: EFFECTS OF ANOXIA ON TISSUE METABOLISM.
AD-616 181 FLD. 6

BIOCHEMISTRY
REPRINT: STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES.
AD-616 169 FLD. 6

•ADJUSTMENT(PSYCHOLOGY)
MATHEMATICAL MODELS
MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS.
AD-616 279 FLD. 5

•ADSORPTION
GASES
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE.
AD-616 116 FLD. 7

•AERODYNAMIC HEATING
HYPERSONIC FLIGHT

AD-615 990 FLD. 20

•AERODYNAMIC LOADING
CYLINDRICAL BODIES
REPRINT: MEASUREMENTS OF FLUCTUATING AIR LOADS ON A CIRCULAR CYLINDER.
AD-616 186 FLD. 1

ROTOR BLADES(ROTARY WINGS)
EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
AD-615 922 FLD. 1

•AFRICA
EARTHQUAKES
REPRINT: SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS.
AD-615 833 FLD. 8

•AGING(PHYSIOLOGY)
HEMOPOIETIC SYSTEM
REPRINT: NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOPOIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST.
AD-616 026 FLD. 6

•AGRICULTURE
AFRICA
ECOLOGY OF MALNUTRITION IN MIDDLE AFRICA (GHANA, NIGERIA, REPUBLIC OF THE CONGO, RWANDA BURUNDI, AND THE FORMER FRENCH EQUATORIAL AFRICA), VOLUME V.
AD-616 257 FLD. 6

•AIR
ION EXCHANGE
HEAVY ION EXCHANGE IN AIR: THEORY.
AD-616 103 FLD. 4

STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 894 FLD. 16

•AIR FORCE
HOSPITALS
INVESTIGATION OF EDP APPLIC ATIONS IN USAF HOSPITALS.
AD-616 362 FLD. 6

•AIR FORCE PERSONNEL
PERSONNEL MANAGEMENT
CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES AIR FORCE.
AD-616 326 FLD. 5

•AIR TRAFFIC CONTROL SYSTEMS
APPROACH
EVALUATION OF PLAN FOR CENTRAL APPROACH CONTROL FACILITY AT JACKSONVILLE.
AD-615 952 FLD. 1

HEIGHT FINDING
HEIGHT CODE TABLES FOR USE WITH AIR TRAFFIC CONTROL RADAR BEACON SYSTEM.
AD-615 818 FLD. 1

•AIR TRANSPORTATION
MILITARY REQUIREMENTS
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION.
AD-616 380 FLD. 15

•AIRCRAFT
APPROACH
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT.
AD-615 893 FLD. 1

ATMOSPHERIC SOUNDING
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

•AIRCRAFT ENGINES
SPARE PARTS
MULTI-LEVEL INVENTORY SYSTEMS: SPARE AIRCRAFT ENGINES.
AD-615 892 FLD. 15

•AIRCRAFT INDUSTRY
OPERATIONS RESEARCH
FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES.
AD-616 923 FLD. 13

•ALASKA
EARTH-HANDLING EQUIPMENT
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61.
AD-616 319 FLD. 13

•ALCOHOLS
CONSUMPTION
TAXATION AND THE DEMAND FOR ALCOHOLIC BEVERAGES.
AD-616 929 FLD. 5

DECOMPOSITION
REPRINT: EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURA TION RATES. VARIATION IN THE ALCOHOL COMPONENT.
AD-616 187 FLD. 7

MONOMOLECULAR FILMS
SURFACE VISCOSITY OF MONOMO LECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

•ALGEBRAS
THEORY
ON THE THEORY OF BOOLEAN FORMULAS: SUBFORMULAS AND SUBSTITUTION OPERATORS.
AD-616 122 FLD. 12

•ALIPHATIC COMPOUNDS
SYNTHESIS(CHEMISTRY)
INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES: THE CHEMISTRY OF 1,3, 5-HEXATRIENE AND ITS

DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

•ALKALI METAL COMPOUNDS
HALL EFFECT
REPRINT: ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

•ALKALI METALS
ELECTRICAL CONDUCTANCE
REPRINT: NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO PHASE METAL VAPORS.
AD-616 162 FLD. 21

•ALKENES
POLYMERIZATION
TRANSLATION OF RUSSIAN RESEARCH: RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF TICL4.
AD-615 983 FLD. 7

•ALUMINUM
COMBUSTION
REPRINT: STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION.
AD-616 143 FLD. 21

FATIGUE(MECHANICS)

AD-616 352 FLD. 11

SHEAR STRESSES
REPRINT: STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM.
AD-616 203 FLD. 20

SINGLE CRYSTALS
MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 341 FLD. 20

•ALUMINUM ALLOYS
CORROSION
MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
AD-615 789 FLD. 11

FRACTURE(MECHANICS)
FRACTURE TOUGHNESS OF X7006-T6351 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
AD-615 781 FLD. 11

•AMIDES
MONOMOLECULAR FILMS
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

•AMINES
CATALYSIS
INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3, 5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

MOLECULAR STRUCTURE
IMPROVED STRUCTURAL CONFORMATION FOR TRIMETHYLAMINE.
AD-615 825 FLD. 7

MONOMOLECULAR FILMS
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

•AMINO ACIDS
PARAMAGNETIC RESONANCE
REPRINT: PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE.
AD-616 062 FLD. 7

•AMMONIA
LIQUEFIED GASES

AD-615 973 FLD. 10

•ANALOG COMPUTERS
PROGRAMMING(COMPUTERS)
CONTINUOUS PROGRAMMING METHODS ON AN ANALOG COMPUTER.
AD-616 375 FLD. 9

•ANCHORS(STRUCTURAL)
LANDING MATS
ANCHOR SYSTEMS FOR PREFABRICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964.
AD-616 249 FLD. 1

•ANOXIA
METABOLISM
REPRINT: EFFECTS OF ANOXIA ON TISSUE METABOLISM.
AD-616 181 FLD. 6

•ANTENNA RADIATION PATTERNS
DIPOLE ANTENNAS
REPRINT: COMBINED RADIATION PATTERN OF THREE ORTHOGONAL DIPOLES.
AD-616 235 FLD. 9

PLASMA SHEATH
ELECTROMAGNETIC PROPERTIES OF A PLASMA-COVERED ANTENNA.
AD-616 123 FLD. 9

•ANTENNAS
TRANSISTOR AMPLIFIERS
INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 396 FLD. 9

•ANTIBIOTICS
PERITONEUM
REPRINT: PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN.
AD-616 137 FLD. 6

•ANTICOAGULANTS
EMBOLISM
REPRINT: PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA.
AD-616 178 FLD. 6

THERAPY
REPRINT: SPECTROPHOTOMETRIC MODIFICATION OF THE TAME ASSAY FOR PROTHROMBIN.
AD-616 180 FLD. 6

•ANTIFERROMAGNETISM
MANGANESE COMPOUNDS
REPRINT: ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE.
AD-616 092 FLD. 20

RESONANCE
REPRINT: ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINDKY-MORIYA COUPLING; ORIENTATION DEPENDENCE IN ALPHA-FE2O3.
AD-616 173 FLD. 20

•ANTIGENS + ANTIBODIES
CEREBROSPINAL FLUID
REPRINT: IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID.
AD-616 228 FLD. 6

KIDNEYS
TRANSLATION OF RUSSIAN RESEARCH: USING THE METHOD OF FLUORESCENT ANTIBODIES TO INVESTIGATE THE ANTIGEN-ANTIBODY REACTION IN TISSUES: STUDYING THE LOCALIZATION OF ANTINEPHRITIC AND ANTIHEPATIC ANTIBODIES IN HOMO-AND HETEROLOGOUS TISSUES.
AD-615 873 FLD. 6

•ANTIGEN-ANTIBODY REACTIONS
COMPLEMENT
REPRINT: LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY.
AD-615 835 FLD. 6
REPRINT: STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS; APPLICATION TO THE ENUMERATION OF SAC'S.
AD-616 201 FLD. 6

TRACER STUDIES
TRANSLATION OF RUSSIAN RESEARCH: USING THE METHOD OF FLUORESCENT ANTIBODIES TO INVESTIGATE THE ANTIGEN-ANTIBODY REACTION IN TISSUES: STUDYING THE LOCALIZATION OF ANTINEPHRITIC AND ANTIHEPATIC ANTIBODIES IN HOMO-AND HETEROLOGOUS TISSUES.
AD-615 873 FLD. 6

•ANTIMONY ALLOYS
GALLIUM ALLOYS
REPRINT: OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX.
AD-616 184 FLD. 20

•ANTISUBMARINE WARFARE
TRAINING DEVICES
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-615 907 FLD. 5

•APPROACH
AIR TRAFFIC CONTROL SYSTEMS
EVALUATION OF PLAN FOR CENTRAL APPROACH CONTROL FACILITY AT JACKSONVILLE.
AD-615 952 FLD. 1

OPTIMIZATION
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT.
AD-615 893 FLD. 1

•ARCTIC REGIONS
ICE
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1962.
AD-616 261 FLD. 8
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1961.
AD-616 262 FLD. 8

STRATOSPHERE
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
AD-616 320 FLD. 4

•ARMED FORCES OPERATIONS
GAME THEORY
SOME MILITARY APPLICATIONS OF THE THEORY OF GAMES.
AD-616 413 FLD. 15

•ARMED FORCES TRANSPORTATION
AIRCRAFT
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION.

AD-616 380 FLD. 15

•AROMATIC COMPOUNDS
POLYMERS
INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3, 5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

•ASCENT TRAJECTORIES
TENDEZVOUS GUIDANCE
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS.
AD-616 422 FLD. 22

•ASTRONAUTS
FEMALES
TRANSLATION OF AUTOBIOGRAPHY OF VALENTINA NIKOLAYEVATERESHKOVA, FIRST FEMALE COSMONAUT OF THE USSR.
AD-615 863 FLD. 22

PERFORMANCE TESTS
INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS.
AD-616 316 FLD. 6

USSR
TRANSLATIONS OF EXCERPTS FROM THE LOGBOOKS KEPT BY THE RUSSIAN COSMONAUTS V. BYKOVSKIY AND T. TERESHKOVA.
AD-615 988 FLD. 16

•ASTRONOMICAL DATA
RADIO INTERFERENCE
REPRINT: RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON.
AD-616 195 FLD. 3

•ATMOSPHERE
ELECTROMAGNETIC WAVES
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION.
AD-615 972 FLD. 4

NOISE
ATMOSPHERIC NOISE PREDICTIONS (10 KC/S).
AD-615 923 FLD. 4

•ATMOSPHERE MODELS
CLIMATOLOGY
STRATOSPHERIC ENRGY PROCESSES AND ASSOCIATED ATMOSPHERIC LONG-WAVE STRUCTURE IN WINTER.
AD-616 124 FLD. 4

UPPER ATMOSPHERE
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM.
AD-616 318 FLD. 4

•ATMOSPHERIC PRECIPITATION
ELECTROSTATIC FIELDS
THE MUTUAL ATTRACTION OF CLOUD DROPLETS IN THE ELECTRO STATIC FIELD OF THE ATMOSPHERE.
AD-616 379 FLD. 4

METEOROLOGICAL RADAR
INVESTIGATION OF THE QUANTI TATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
AD-615 772 FLD. 4

•ATMOSPHERIC SOUNDING
INSTRUMENTATION
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

OZONE
REPRINTS: (1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS.
AD-616 008 FLD. 4

•ATMOSPHERICS
VERY LOW FREQUENCY
ATMOSPHERIC NOISE PREDICTIONS (10 KC/S).
AD-615 923 FLD. 4

•ATOMIC ENERGY LEVELS
MAGNETIC FIELDS
REPRINT: INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT.
AD-616 174 FLD. 20

•ATOMS
SPIN
SPIN-EXCHANGE SCATTERING IN UNIFORM MAGNETIC FIELDS.
AD-615 978 FLD. 20

TRANSPORT PROPERTIES
REPRINT: AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL.
AD-616 228 FLD. 20

•ATTENTION
PSYCHOMETRICS
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
AD-615 921 FLD. 5

•ATTITUDE CONTROL SYSTEMS
SPACECRAFT
REPRINT: VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
AD-616 189 FLD. 22

•ATTITUDES
USSR
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW.
AD-616 917 FLD. 5

•AUDIOMETRY
ARMY PERSONNEL
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER RIFLES.
AD-615 934 FLD. 6

•AUTOMATIC NAVIGATORS
ORBITAL TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX.
AD-615 856 FLD. 22

•BACILLUS ANTHRACIS
CELL WALL
REPRINT: CHEMISTRY OF THE CELL WALLS OF BACILLUS ANTHRACIS: THE EFFECT OF PENIC ILLIN.
AD-616 198 FLD. 6

•BAND SPECTRUM
INTENSITY
REPRINT: SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H20.
AD-616 089 FLD. 20

•BAND-PASS FILTERS
DESIGN
INVESTIGATION OF FILTER CHARACTERISTICS OF ARRAYED CONDUCTORS BETWEEN GROUND PLANES.
AD-616 229 FLD. 9

•BANKING
COSTS
REPRINT: ECONOMICS OF SCALE IN THE SAVINGS AND LOAN INDUSTRY OF CALIFORNIA.
AD-616 193 FLD. 5

•BATTERIES + COMPONENTS
AMMONIA

AD-615 973 FLD. 10

ELECTROLYTES

AD-616 389 FLD. 10

NITROBENZENES
PRIMARY BATTERIES DEPOLARIZED WITH META-DINITROBENZENE.
AD-616 120 FLD. 10

•BEACHES
EXPERIMENTAL DATA
EXPERIMENTAL STUDY OF LONGSHORE CURRENTS ON A PLANE BEACH.
AD-615 790 FLD. 8

MAINTENANCE
BEHAVIOR OF BEACH FILL AND BORROW AREA AT SEASIDE PARK, BRIDGEPORT, CONNECTICUT.
AD-615 791 FLD. 13

ROCK(GEOLOGY)
REPRINT: SOUTHERN HEMISPHERE BEACH ROCK.
AD-616 231 FLD. 8

STRUCTURAL GEOLOGY
REPRINT: BEACH PROCESS STUDIES.
AD-616 141 FLD. 8

•BEAMS(STRUCTURAL)
DEFORMATION
PLASTIC DEFORMATION OF BEAMS UNDER EXPLOSIVE STRESS.
AD-616 330 FLD. 19

FATIGUE(MECHANICS)
REPRINT: FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 039 FLD. 13

VIBRATION
METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS.
AD-616 345 FLD. 13

•BEEF
FREEZE DRYING
INVESTIGATION INTO THE MECHANISM OF FREEZE DRYING.
AD-615 890 FLD. 6

•BEHAVIOR
ECOLOGY
ECOLOGY AND THE SCIENCE OF PSYCHOLOGY.
AD-615 765 FLD. 5

•BENZIMIDAZOLES
POLYMERS
TRANSLATION OF RUSSIAN RESEARCH. SYNTHESIS AND INVESTI GATION OF PROPERTIES OF CERTAIN HOMOGENEOUS AND MIXED POLYBENZ IMIDAZOLES.

AD-615 865 FLD. 11
TRANSLATION OF RUSSIAN RESEARCH: DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN.
AD-615 991 FLD. 7

•BERYLLIUM
ELECTRON SCATTERING
REPRINT: ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11.
AD-616 193 FLD. 20

•BIBLIOGRAPHIES
COMMUNICATION THEORY
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS.
AD-616 113 FLD. 12

INSECTS
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6.
AD-616 003 FLD. 6

LANGUAGE
GUIDE TO RUSSIAN REFERENCE AND LANGUAGE AIDS: AN ANNOTATED BIBLIOGRAPHY.
AD-616 404 FLD. 5

METEOROLOGICAL INSTRUMENTS
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART II. BIBLIOGRAPHY.
AD-616 396 FLD. 4

RADIATION DAMAGE
MONTHLY ACCESSION LIST. ABSTRACT NO. 27565 TO 27614, PART I.
AD-616 247 FLD. 18

RADIO WAVES
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES.
AD-615 936 FLD. 20

•BINOMIALS
DISTRIBUTION THEORY
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(RIN,P) FOR LARGE N AND SMALL P.
AD-616 370 FLD. 12

•BIOLOGICAL LABORATORIES
REPORTS
REPRINT ACCESSION LIST 1964.
AD-616 280 FLD. 6

•BLACKBODY RADIATION
OPTICAL ANALYSIS
REPRINT: TEMPORAL COHERENCE OF BLACK BODY RADIATION.
AD-616 223 FLD. 20

TABLES
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES.
AD-616 271 FLD. 20

•BLOOD CHEMISTRY
GOLD
REPRINT: POLAROGRAPHIC DETERMINATION OF TRACES OF GOLD IN BLOOD AND SERUM.
AD-616 138 FLD. 6

HYDRAZINE
REPRINT: BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS.
AD-616 159 FLD. 6

•BLOOD COAGULATION
BLOOD DISEASES
REPRINT: RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS.
AD-616 177 FLD. 6

•BLOOD PLATELETS
HEMATOLOGY

AD-616 393 FLD. 6

•BLOOD TRANSFUSIONS
BLOOD VOLUME
REPRINT: EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS.
AD-616 170 FLD. 6

•BLOOD VESSELS
EMBOLISM
REPRINT: PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA.
AD-616 178 FLD. 6

•BLOOD VOLUME
BLOOD TRANSFUSIONS
REPRINT: EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS.
AD-616 170 FLD. 6

•BLOWERS
GAS BEARINGS
DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13

•BLUNT BODIES
HYPERSONIC FLOW
NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
AD-615 901 FLD. 1

•BODIES OF REVOLUTION
HYPERSONIC FLOW
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER.
AD-615 944 FLD. 1

•BODY WEIGHT
NERVE CELLS
REPRINT: KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE.
AD-616 139 FLD. 6

•BONE MARROW
PATHOLOGY

AD-616 393 FLD. 6

•BOROHYDRIDES
CENTRAL NERVOUS SYSTEM
REPRINT: EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMNES AS INFLUENCED BY PARGYLIN HYDROCHLORIDE AND IPRONIAZID PHOSPHATE.
AD-616 158 FLD. 6

•BORON
ELECTRON SCATTERING
REPRINT: ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11.
AD-616 193 FLD. 20

•BORRELIA
DISEASES
REPRINT: BORRELIAE, HUMAN RELAPSING FEVER, AND PARASITE VECTOR-HOST RELATIONSHIPS.
AD-616 135 FLD. 6

•BOUNDARY LAYER
AERODYNAMIC CHARACTERISTICS
FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART.
AD-616 236 FLD. 1

•BOUNDARY VALUE PROBLEMS
ITERATIVE METHODS
SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS.
AD-616 301 FLD. 12

WAVEGUIDES
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY.
AD-615 827 FLD. 9

•BRASS
CREEP
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES.
AD-615 927 FLD. 11

•BREATHING APPARATUS
DESIGN
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 1. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS.
AD-615 771 FLD. 13

•BUCKLING(MECHANICS)
DIGITAL COMPUTERS
REPRINT: COMPUTERS IN SOLID MECHANICS: A CASE HISTORY.
AD-615 837 FLD. 20

•BURNING RATE
TEST EQUIPMENT
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

•CADMIUM COMPOUNDS
PHOTOCONDUCTIVITY

AD-615 868 FLD. 9

SULFIDES
NEW SOLID-STATE DEVICE CONCEPTS.
AD-616 350 FLD. 20

•CALCULUS OF VARIATIONS
POTENTIAL THEORY
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY.
AD-616 099 FLD. 20

•CANCER
MAMMARY GLANDS
REPRINT: HEMANGIOSARCOMA OF THE BREAST.
AD-616 027 FLD. 6

•CAPACITORS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9
PEM FOR PRODUCTION OF FLUORINATED BARIUM TITANATE CAPACITORS FOR OPERATION TO 200 C.
AD-615 899 FLD. 9

POTENTIAL THEORY
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY.
AD-616 099 FLD. 20

RADIATION DAMAGE

STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION OF ELECTRONIC PARTS AND MATERIALS (SCORRE).
AD-616 007 FLD. 9

•CAPILLARY TUBES
TRANSITION TEMPERATURE
REPRINT: BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS.
AD-616 022 FLD. 20

•CARBON DIOXIDE
BREATHING APPARATUS
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 1. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS.
AD-615 771 FLD. 13

RESPIRATION
CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
AD-615 967 FLD. 6

•CARBOXYLIC ACIDS
MONOMOLECULAR FILMS
SURFACE VISCOSITY OF MONOMO LECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

PARAMAGNETIC RESONANCE
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACIDIRRDTD AT LOW THATURE.
AD-616 063 FLD. 20

•CARDIOVASCULAR DISEASES
LEVARTERENOL
REPRINT: EFFECT OF 1-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THEVALSALVA MANEUVER.
AD-615 843 FLD. 6

•CATALYSTS
SEMICONDUCTORS
TRANSLATION OF RUSSIAN TRANSLATION: CATALYSIS ON AN ORGANIC SEMICONDUCTOR MADE FROM POLYACRYLONITRILE.
AD-615 989 FLD. 7

•CATHODIC PROTECTION
ALUMINUM ALLOYS
MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
AD-615 789 FLD. 11

•CAVITY RESONATORS
DESIGN
REPRINT: BACKABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE.
AD-616 145 FLD. 14

•CELESTIAL MECHANICS
SPACE NAVIGATION
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

•CELESTIAL NAVIGATION
SPACECRAFT
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

•CENTRAL NERVOUS SYSTEM
BOROHYDRIDES
REPRINT: EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMNES AS INFLUENCED BY PARGYLIN HYDROCHLORIDE AND IPRONIAZID PHOSPHATE.
AD-616 198 FLD. 6

•CERAMIC CAPACITORS
FLUORINATION
PEM FOR PRODUCTION OF FLUOR INATED BARIUM TITANATE CAPACITORS FOR OPERATION TO 200 C.
AD-615 899 FLD. 9

•CERAMIC FIBERS
REINFORCING MATERIALS
BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-615 817 FLD. 11

•CERAMIC MATERIALS
PHASE STUDIES
REPRINT: SOLID SOLUTION AND PRECIPITATION HARDENING IN MG-FE-O ALLOYS.
AD-616 096 FLD. 11

•CEREBRAL CORTEX
SENSORY PERCEPTION
TRANSLATION OF RUSSIAN RESEARCH: OPPOSITE CHANGES IN ELECTROPHYSIOLOGICAL REACTIONS OF THE HUMAN BRAIN IN ADOPTING THE FREQUENCY OF LIGHT FLASHES AT VESTIBULAR AND OPTOKINETIC STIMULI.
AD-616 311 FLD. 6

•CEREBROSPINAL FLUID
ELECTROPHORESIS
REPRINT: IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID.
AD-616 228 FLD. 6

•CESIUM
IONIZATION
THE IONIZATION OF CESIUM IN TUNGSTEN CAPILLARIES.
AD-615 932 FLD. 7

•CHARGED PARTICLES
MOTION
REPRINT: ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE.
AD-616 234 FLD. 20

OPERATORS(MATHEMATICS)
REPRINT: SU(6) AND CHARGE FORM FACTORS.
AD-616 091 FLD. 20

•CHECKOUT EQUIPMENT
AUTOMATIC
HOW MUCH AUTOMATICITY FOR CHECKOUT EQUIPMENT.
AD-616 928 FLD. 19

•CHEMICAL BONDS
SPECTRA(INFRARED)
REPRING: NORMAL COORDINATE ANALYSIS OF HYDROGEN-BONDED COMPOUNDS. THE ACID MALEATE ION.
AD-616 074 FLD. 7

•CHEMICAL REACTIONS
REACTION KINETICS
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 338 FLD. 7

•CHINA
INDUSTRIAL PRODUCTION
SOVIET AND COMMUNIST CHINESE INDUSTRIALIZATION STRATEGIES.
AD-615 942 FLD. 5

•CHLAMYDIA TRACHOMATIS
VACCINES
REPRINT: REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964.
AD-616 014 FLD. 6

•CHROMATOGRAPHIC ANALYSIS
ETHERS
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS LIQUID CHROMATOGRAPHY.
AD-615 959 FLD. 7

•CHROMIUM COMPOUNDS
PHOSPHATES
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE.
AD-616 308 FLD. 11

•CHYMOTRYPSIN
BIOCHEMISTRY
REPRINT: POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN.
AD-616 081 FLD. 6

•CIRCUITS
ELECTRON BEAMS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICRO WAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
AD-615 939 FLD. 9

SUPERCONDUCTIVITY
SUPERCONDUCTIVE TANK CIRCUITS AS NETWORK ELEMENTS.
AD-615 969 FLD. 9

THEORY
DIRECTIONS OF MATHEMATICAL RESEARCH IN NONLINEAR CIRCUIT THEORY.
AD-616 366 FLD. 9

•CIVIL DEFENSE SYSTEMS
RADIATION MONITORS
RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER.
AD-615 911 FLD. 15

SHELTERS
DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY.
AD-615 779 FLD. 15

•CIVIL ENGINEERING
TERRAIN
QUANTITATIVE TERRAIN FACTORS AS RELATED TO SOIL PARENT MATERIALS AND THEIR ENGINEERING CLASSIFICATION.
AD-616 363 FLD. 8

•CLIMATOLOGY
PERIODIC VARIATIONS
TRANSLATION OF RUSSIAN RESEARCH: IS THE BRIKNER (BRUECKNER) CYCLE REAL.
AD-615 768 FLD. 4

•CLOUD COVER
DISTRIBUTION
DISTRIBUTIONS AND CHARACTER ISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
AD-616 295 FLD. 4

STOCHASTIC PROCESSES
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, ESTIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
AD-616 394 FLD. 4

•CLOUDS
DROPS
DYNAMIC SIMILARITY AND THE MODELING OF CLOUD DROPLETS.
AD-616 399 FLD. 8

PROBES(ELECTROMAGNETIC)
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
AD-616 347 FLD. 4

•COATINGS

OXIDES
CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS.
AD-615 941 FLD. 11

PHOTOELASTICITY

AD-615 990 FLD. 20

•COCKPITS
THERMAL RADIATION
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•COLD WAR
THEORY
SCIENTIST'S NOTES ON THE COLD WAR.
AD-616 365 FLD. 15

•COLOR CENTERS
EXCITATION
REPRINT: LIFETIME OF THE EXCITED I(-) CENTER IN KCl.
AD-616 082 FLD. 20

•COLORS
MAPS
THE COLOR PROBLEM.
AD-616 382 FLD. 8

•COMBINATORIAL ANALYSIS
REAL VARIABLES
REPRINT: A STRONG LAW FOR THE MAXIMUM CUMULATIVE SUM OF INDEPENDENT RANDOM VARIABLES.
AD-616 194 FLD. 12

•COMBUSTION
GASES
TRANSLATION OF RUSSIAN RESEARCH: PULSATING COMBUSTION OF GAS BEHIND A SHOCK WAVE IN S RSONIC FLOW.
AD-615 985 FLD. 21

ROCKET PROPELLANTS
EXPERIMENTAL INVESTIGATION OF STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN.
AD-615 798 FLD. 21

•COMBUSTION CHAMBERS
THERMODYNAMICS
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID PROPELLANT ROCKET ENGINE.
AD-616 129 FLD. 21

•COMMERCE
GOVERNMENT(FOREIGN)
TOWARD A GENERAL THEORY OF CUSTOMS UNIONS FOR DEVELOPING COUNTRIES.
AD-616 309 FLD. 5

USSR
SOVIET-SATELLITE TRADE: A BROADENED ANALYSIS.
AD-616 930 FLD. 5

•COMMUNICATION THEORY
DATA PROCESSING SYSTEMS
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS.
AD-616 113 FLD. 12

STATISTICAL ANALYSIS
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZATION.
AD-616 112 FLD. 13

•COMPLEMENT
ANTIGEN-ANTIBODY REACTIONS
REPRINT: LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY.
AD-615 835 FLD. 6

•COMPOSITE MATERIALS
BONDING
BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-615 817 FLD. 11

•COMPRESSOR NOISE
REDUCTION
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVITION OF LIFT FAN NOISE.
AD-616 267 FLD. 1

•COMPUTER LOGIC
RESONATORS
TRANSLATION OF RUSSIAN ARTICLES.
AD-616 269 FLD. 9

SWITCHING CIRCUITS
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC.
AD-616 325 FLD. 9

•COMPUTERS
MAGNETOMETERS
TRANSLATION OF RUSSIAN PATENT ON A DEVICE FOR COMPENSATING CONSTANT, INDUCTIVE AND MAGNETIC INTERFERENCES OF EDDY CURRENTS.
AD-615 987 FLD. 20

•CONCRETE
REINFORCING MATERIALS
REPRINT: FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 035 FLD. 13

•CONDENSATION
AERODYNAMIC CHARACTERISTICS
DIGITAL COMPUTER PROGRAM FOR CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS.
AD-615 902 FLD. 1

•CONICAL BODIES
VORTICES
REPRINT: THE VORTICAL LAYER ON AN INCLINED CONE.
AD-616 204 FLD. 1

•CONSTRUCTION
POLAR REGIONS
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW.
AD-615 996 FLD. 13
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW.
AD-615 997 FLD. 14

•CONTROL JETS
SPACECRAFT
TRANSLATION OF RUSSIAN RESEARCH: CERTAIN PROBLEMS OF OPTIMUM CONTROL OF THREE DIMENSIONAL MOTION OF SPACE VEHICLES.
AD-615 854 FLD. 22

•CONTROL SYSTEMS
AUTOMATIC
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF AUTOMATIC CONTROL SYSTEMS BY THE METHOD OF SUCCESSIVE APPROXIMATIONS.
AD-615 869 FLD. 14

•CONVECTION
CUMULUS CLOUDS
TWO STUDIES OF CONVECTION. A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION. HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS.
AD-616 094 FLD. 4

•COOLING
INFRARED DETECTORS
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR.
AD-616 119 FLD. 13

•COPPER
CREEP
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER.
AD-615 926 FLD. 11

FATIGUE(MECHANICS)

AD-616 352 FLD. 11

•COPPER ALLOYS
CRYSTAL LATTICE DEFECTS
REPRINT: CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS.
AD-616 068 FLD. 20

•CORRELATORS
ACOUSTIC DETECTORS
REPRINT: OPTICAL-CORRELATION DETECTOR FOR THE AUDIO FREQUENCY RANGE.
AD-616 069 FLD. 17

•CORROSION
STRESSES
MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
AD-615 789 FLD. 11

•CORROSION INHIBITION
PHOSPHATE COATINGS
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE.
AD-616 308 FLD. 11

STEEL
CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS.
AD-615 941 FLD. 11

•CORROSIVE LIQUIDS
ORGANIC COMPOUNDS
EMBRITTLEMENT OF METALS BY ORGANIC LIQUIDS.
AD-616 302 FLD. 11

•COSMIC RAYS
INTENSITY
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963.
AD-616 297 FLD. 18

•COSTS
EFFECTIVENESS
COST-FECTIVENESS: AN INTRODUCTION AND OVERVIEW.
AD-616 339 FLD. 5

MILITARY REQUIREMENTS
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES.
AD-616 359 FLD. 13

OPTIMIZATION
AN OUT-OF-KILTER METHOD FOR MINIMAL COST FLOW PROBLEMS.
AD-615 884 FLD. 5

•COUETTE FLOW
ELECTRICAL CONDUCTANCE
VARIABLE CONDUCTIVITY MFD COUETTE FLOW.
AD-616 354 FLD. 20

•CREEP
BRASS
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPE

RATURE CREEP BEHAVIOR OF ALPHA BRASSES.
AD-615 927 FLD. 11

COPPER
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER.
AD-615 926 FLD. 11

NYLON
TRANSLATION OF RUSSIAN RESEARCH: THE EFFECT OF ULTRA VIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS.
AD-616 283 FLD. 11

•CRIMINOLOGY
INFORMATIONAL RETRIEVAL
TEXTIR: A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM.
AD-615 763 FLD. 9

•CRYSTAL GROWTH
QUARTZ
SYNTHETIC QUARTZ PILOT PLANT.
AD-615 896 FLD. 13
SYNTHETIC QUARTZ.
AD-615 897 FLD. 13

SEMICONDUCTORS
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS.
AD-616 002 FLD. 20

•CRYSTAL HOLDERS
MANUFACTURING METHODS
CRYSTAL UNITS TYPE CR-(XM-11)/U, 1 TO 20 MC IN THE TYPE HC-27/U GLASS HOLDERS.
AD-616 388 FLD. 9

•CRYSTAL LATTICE DEFECTS
FREQUENCY
REPRINT: LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTIT UTIONAL MASS DEFECTS IN SODIUM IODIDE.
AD-616 098 FLD. 20

HALIDES
A FUNDAMENTAL STUDY OF DEFECT-DISLOCATION INTERACTION IN NACL TYPE LATTICES.
AD-615 979 FLD. 20

METALS

AD-616 352 FLD. 11

STRESSES
REPRINT: DISLOCATION VELOCITIES IN A LINEAR CHAIN.
AD-616 215 FLD. 20

X-RAY DIFFRACTION ANALYSIS

AD-615 917 FLD. 11
REPRINT: A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION.
AD-616 061 FLD. 20

•CRYSTAL LATTICES
CLASSIFICATION
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
AD-616 246 FLD. 20

DEFORMATION

AD-616 052 FLD. 20

VIBRATION
REPRINT: LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTIT UTIONAL MASS DEFECTS IN SODIUM IODIDE.
AD-616 098 FLD. 20

•CRYSTAL MIXERS
MODULATION
REPRINT: INTERMODULATION ANALYSIS OF A CRYSTAL MIXER.
AD-615 829 FLD. 9

•CRYSTAL RECTIFIERS
PHOTOCONDUCTIVITY

AD-615 868 FLD. 9

•CRYSTAL STRUCTURE
GOLD ALLOYS
REPRINT: ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUM-GOLD (UBER DIE KRISTALLSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-GOLD UND RUBIDIUM-GOLD).
AD-616 053 FLD. 20

HALOGENATED HYDROCARBONS
REPRINT: CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 033 FLD. 20

NIOBIUM
REPRINT: RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM.
AD-616 020 FLD. 20

ZIRCONATES
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•CRYSTALS
MANUFACTURING METHODS
SYNTHETIC QUARTZ PILOT PLANT.
AD-615 896 FLD. 13
SYNTHETIC QUARTZ.
AD-615 897 FLD. 13

PHONONS
PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

RADIATION DAMAGE
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 249 FLD. 18

SEMICONDUCTOR DEVICES
CRYSTAL UNITS TYPE CR-(XM-11)/U, 1 TO 20 MC IN THE TYPE HC-27/U GLASS HOLDERS.
AD-616 388 FLD. 9

•CULICIDAE
FOOD
REPRINT: STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER.
AD-616 072 FLD. 6

UNITED STATES
REPRINT: OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS.
AD-615 836 FLD. 6

•CULTURE
SOCIAL PSYCHOLOGY
REPRINT: JAPANESE VS. AMERICAN VALUES.
AD-616 196 FLD. 5

•CUMULUS CLOUDS
PHOTOGRAMMETRY
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

•CYBERNETICS
SCIENTIFIC PERSONNEL
REPRINT: NORBERT WIENER, 1894-1964: BIOGRAPHICAL ARTICLES.
AD-616 066 FLD. 14

•CYLINDRICAL BODIES
AERODYNAMIC LOADING
REPRINT: MEASUREMENTS OF FLUCTUATING AIR LOADS ON A CIRCULAR CYLINDER.
AD-616 186 FLD. 1

FLUID DYNAMIC PROPERTIES
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION.
AD-616 102 FLD. 1

ROTATION
REPRINT: VISCOUS FLOW BETWEEN ROTATING CONCENTRIC CYLINDERS WITH A CIRCUMFERENTIAL PRESSURE GRADIENT AT SPEEDS ABOVE CRITICAL.
AD-616 084 FLD. 20

STABILITY
TRANSLATION OF RUSSIAN RESEARCH: STABILITY OF AN ANISOTROPIC CIRCULAR CYLINDRICAL SHELL DURING LONGITUDINAL COMPRESSION, INTERNAL PRESSURE AND IRREGULAR HEATING IN LENGTH.
AD-615 872 FLD. 20

•CYTOPLASM
FREEZING
REPRINT: EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES.
AD-616 226 FLD. 6

•DAMPING
THEORY
THEORY OF THE UNSYMMETRIC NUTATION DAMPER.
AD-615 889 FLD. 20

•DATA PROCESSING SYSTEMS
INPUT-OUTPUT DEVICES
JOSS: EXPERIENCE WITH AN EXPERIMENTAL COMPUTING SERVICE FOR USERS AT REMOTE TYPEWRITER CONSOLES.
AD-615 943 FLD. 9

INVENTORY CONTROL
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT.
AD-615 948 FLD. 15

PRODUCTION CONTROL
INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM.
AD-616 241 FLD. 13

•DATA TRANSMISSION SYSTEMS
PULSE MODULATION
APPLICATION OF MONOCYCLE POSITON MODULATION TO THE TRANSMISSION OF BINARY DIGITAL DATA.
AD-615 965 FLD. 9

RADIO COMMUNICATION SYSTEMS
DATA TRANSMISSION INVESTIGATION (SHORT RANGE HF RADIO DATA TRANSMISSION).
AD-615 979 FLD. 17

•DECAY SCHEMES
S-MATRIX
REPRINT: LIFETIME AND DECAY OF UNSTABLE PARTICLES

IN S-MATRIX THEORY.
AD-616 048 FLD. 18

•DECISION MAKING
COSTS
COST-FECTIVENESS: AN INTRO DUCTION AND OVERVIEW.
AD-616 339 FLD. 5

•DECISION THEORY
STATISTICAL ANALYSIS
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZATION.
AD-616 112 FLD. 13

•DECOMPOSITION
REACTION KINETICS
REPRINT: EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURA TION RATES. VARIATION IN THE ALCOHOL COMPONENT.
AD-616 187 FLD. 7

•DELAY CIRCUITS
PHASE SHIFTERS
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
AD-616 269 FLD. 9

•DENTISTRY
SALIVA
REPRINT: REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE.
AD-616 030 FLD. 6

•DETECTION
SIGNALS
TRANSLATION OF RUSSIAN RESEARCH: DETECTION OF SIGNALS IN A STREAM OF PULSES.
AD-615 954 FLD. 17

•DETERRENCE
DEFENSE SYSTEMS
IS DETERRENCE ENOUGH OR SHOULD WE BE PREPARED TO FIGHT 'A GENERAL WAR IN THE 1960'S.
AD-616 914 FLD. 5

•DETONATIONS
SPECTROSCOPY
TRANSLATION OF RUSSIAN RESEARCH: SPECTROSCOPIC INVES TIGATION OF THE STATE OF GAS BEHIND A DETONATION FRONT.
AD-615 984 FLD. 19

•DEUTERONS
ELASTIC SCATTERING
REPRINT: ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES.
AD-616 079 FLD. 20

ELEMENTARY PARTICLES
REPRINT: EVIDENCE THAT THE DEUTRON IS NOT AN ELEMENTARY PARTICLE.
AD-616 219 FLD. 20

•DIBASIC ACIDS
SPECTRA(INFRARED)
REPRING: NORMAL COORDINATE ANALYSIS OF HYDROGEN-BONDED COMPOUNDS. THE ACID MALEATE ION.
AD-616 074 FLD. 7

•DIELECTRIC PROPERTIES
FERROELECTRIC MATERIALS
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
AD-615 930 FLD. 20

•DIFFERENTIAL CROSS SECTION
NUCLER MODELS
REPRINT: EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS.
AD-616 080 FLD. 20

•DIFFERENTIAL EQUATIONS
BOUNDARY VALUE PROBLEMS
TRANSLATION OF RUSSIAN RESEARCH: ON METHODS OF ECONO MIZING THE MEMORIES OF DIGITAL COMPUTERS WHEN SOLVING DIFFERENTIAL EQUATION SYSTEMS.
AD-616 309 FLD. 9

DEFORMATION
DRAGGING ALONG AND INVARIANT DIFFERENTIATION.
AD-615 946 FLD. 12

FUNCTIONAL ANALYSIS
LINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFI CIENTS.
AD-615 806 FLD. 12

ITERATIVE METHODS
ON A PHASE METHOD FOR TREATING STURM-LIOUVILLE EQUATIONS AND PROBLEMS.
AD-616 373 FLD. 12

ROTATION
TRANSLATION OF RUSSIAN RESEARCH: ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE.
AD-615 860 FLD. 22

•DIFFERENTIAL GEOMETRY
THEOREMS
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE.
AD-616 278 FLD. 12

•DIFFUSION
NEUTRON TRANSPORT THEORY
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE.
AD-616 403 FLD. 20
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

THERMODYNAMICS
REPRINT: ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS.
AD-616 161 FLD. 20

•DIGITAL COMPUTERS
BOUNDARY VALUE PROBLEMS
TRANSLATION OF RUSSIAN RESEARCH: ON METHODS OF ECONO MIZING THE MEMORIES OF DIGITAL COMPUTERS WHEN SOLVING DIFFERENTIAL EQUATION SYSTEMS.
AD-616 309 FLD. 9

BUCKLING(MECHANICS)
REPRINT: COMPUTERS IN SOLID MECHANICS: A CASE HISTORY.
AD-615 837 FLD. 20

DESIGN
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS.
AD-616 117 FLD. 9

RESONATORS
TRANSLATION OF RUSSIAN ARTICLES.
AD-616 269 FLD. 9

•DIODES(SEMICONDUCTOR)
MICROWAVE EQUIPMENT
MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

•DIPOLE ANTENNAS
ANTENNA RADIATION PATTERNS
REPRINT: COMBINED RADIATION PATTERN OF THREE ORTHOGONAL DIPOLES.
AD-616 239 FLD. 9

•DIRECT CURRENT
MEASUREMENT
REPRINT: OPTIMUM RC FILTERING AND INTEGRATION FOR SEQUENTIAL MEASUREMENT OF DC SIGNALS.
AD-616 191 FLD. 14

•DISEASE VECTORS
BIBLIOGRAPHIES
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6.
AD-616 003 FLD. 6

BORRELIA
REPRINT: BORRELIAE, HUMAN RELAPSING FEVER, AND PARASITE VECTOR-HOST RELATIONSHIPS.
AD-616 139 FLD. 6

•DISTILLATION
URINE
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
AD-615 979 FLD. 6

•DISTRIBUTION(ECONOMICS)
COSTS
AN OUT-OF-KILTER METHOD FOR MINIMAL COST FLOW PROBLEMS.
AD-615 884 FLD. 5

•DOCUMENTATION
MICROFILM
AD-615 800 FLD. 5

SYSTEMS ENGINEERING
ALPHA 1 (AUTOMATED LITERATURE PROCESSING, HANDLING, AND ANALYSIS SYSTEM): STATUS AT REDSTONE SCIENTIFIC INFORMATION CENTER.
AD-615 813 FLD. 5

•DRAG
PARTICLES
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES.
AD-616 400 FLD. 1

•DRY CELLS
POLARIZATION
PRIMARY BATTERIES DEPOLARIZED WITH META-DINITROBENZENE.
AD-616 120 FLD. 10

•DYNAMIC PROGRAMMING
CONTROL SYSTEMS
SOME ASPECTS OF ADAPTIVE CONTROL PROCESSES.
AD-616 371 FLD. 12

EQUATIONS
FUNCTIONAL EQUATIONS IN THE THEORY OF DYNAMIC PROGRAMMING. XI: LINIT THEOREMS.
AD-616 408 FLD. 12

MANUFACTURING METHODS
THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
AD-616 111 FLD. 13

THEORY
DYNAMIC PROGRAMMING AND CLASSICAL ANALYSIS.
AD-616 381 FLD. 12

•EARPHONES
DESIGN
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
AD-615 953 FLD. 17

•EARTH
DENSITY
REPRINT: CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE.
AD-616 168 FLD. 8

GEOPHYSICS
TRANSLATION OF RUSSIAN ANALYSIS ON ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE.
AD-619 879 FLD. 16

PHYSICAL PROPERTIES
REPRINT: LATTICE DYNAMICS IN GEOPHYSICS.
AD-616 167 FLD. 8

•EARTH MODELS
SEISMOLOGY
REPRINT: TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE.
AD-619 838 FLD. 8
REPRINT: AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES.
AD-619 842 FLD. 8

•EARTHQUAKES
AFRICA
REPRINT: SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS.
AD-619 833 FLD. 8

DATA
REPRINT: A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETERMINATION USING S-WAVE DATA.
AD-619 840 FLD. 8

USSR
REPRINT: APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION.
AD-619 841 FLD. 8

•EARTH-HANDLING EQUIPMENT
ALASKA
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61.
AD-616 314 FLD. 13

•EASTERN EUROPE
ECONOMICS
COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC.
AD-619 887 FLD. 5

•ECOLOGY
ALASKA
PEDO-ECOLOGICAL INVESTIGATIONS, BARROW, ALASKA.
AD-619 998 FLD. 8

BEHAVIOR
ECOLOGY AND THE SCIENCE OF PSYCHOLOGY.
AD-619 768 FLD. 5

•ECONOMICS
ALCOHOLS
TAXATION AND THE DEMAND FOR ALCOHOLIC BEVERAGES.
AD-616 429 FLD. 5

EASTERN EUROPE
COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC.
AD-619 887 FLD. 5

FRANCE
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES.
AD-616 428 FLD. 5

GAME THEORY
COMPOSITION OF GENERAL SUM GAMES.
AD-616 319 FLD. 5

GOVERNMENT(FOREIGN)
TOWARD A GENERAL THEORY OF CUSTOMS UNIONS FOR DEVELOPING COUNTRIES.
AD-616 309 FLD. 5

MATHEMATICAL MODELS
ON ECONOMIC ENTROPY.
AD-616 292 FLD. 5

NONLINEAR PROGRAMMING
QUASI-CONCAVE PROGRAMMING.
AD-616 411 FLD. 5

USSR
SOVIET NATIONAL INCOME AND PRODUCT, 1958-1962: PART I. NATIONAL INCOME AT ESTABLISHED PRICES.
AD-616 306 FLD. 5
AN INDEX OF SOVIET INDUSTRIAL OUTPUT.
AD-616 412 FLD. 5
SOVIET-SATELLITE TRADE: A BROADENED ANALYSIS.
AD-616 430 FLD. 5

•EDUCATION
TEACHING MACHINES
ESSENTIAL PRINCIPLES OF PROGRAMED INSTRUCTION.
AD-616 296 FLD. 5

•ELASTIC SCATTERING
ATOMS
SPIN-EXCHANGE SCATTERING IN UNIFORM MAGNETIC FIELDS.
AD-619 978 FLD. 20

DEUTERONS
REPRINT: ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES.
AD-616 079 FLD. 20

•ELASTICITY
BEAMS(STRUCTURAL)
METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS.
AD-616 349 FLD. 13

•ELASTOMERES
PHOTOELASTICITY
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 4485.
AD-616 391 FLD. 11

•ELASTOMERS
PHYSICAL PROPERTIES
EVALUATION OF ETHYLENE PROPYLENE TERPOLYMER ELASTOMERS.
AD-616 322 FLD. 11

•ELECTRIC ARCS
COOLING
CONSTRICTED TRANSPIRATION-COOLED ARCS FOR PRODUCING A GAS STREAM OF HIGH ENTHALPY.
AD-619 903 FLD. 20

ELECTRIC DISCHARGES
TRANSLATION OF RUSSIAN RESEARCH: DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE.
AD-619 864 FLD. 20

HEAT TRANSFER
EFFECTS OF METAL VAPORS ON RADIATION HEAT TRANSFER CHARACTERISTICS OF ARC AND PLASMA SYSTEMS.
AD-616 110 FLD. 20

•ELECTRIC DISCHARGES
ELECTRIC ARCS
TRANSLATION OF RUSSIAN RESEARCH: DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE.
AD-619 864 FLD. 20

•ELECTRIC FILTERS
SYNTHESIS
TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLICATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS.
AD-616 266 FLD. 9

•ELECTRICAL CONDUCTANCE
COUETTE FLOW
VARIABLE CONDUCTIVITY MFD COUETTE FLOW.
AD-616 394 FLD. 20

VAPORS
REPRINT: NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO PHASE METAL VAPORS.
AD-616 162 FLD. 21

•ELECTRICAL CORONA
CONFIGURATION
REPRINT: THE VELOCITY OF STREAMER TIPS IN IMPULSE POINT TO-PLANE CORONA IN AIR, USING LICHTENBERG FIGURE TECHNIQUES.
AD-616 076 FLD. 20

PROPAGATION
REPRINT: THE LIFETIME OF POSITIVE STREAMERS IN A PULSED POINT-TO-PLANE GAP IN ATMOSPHERIC AIR.
AD-616 077 FLD. 20
REPRINT: A MODEL FOR STREAMER PROPAGATION.
AD-616 078 FLD. 20

•ELECTRICAL DISCHARGES
INSTRUMENTATION
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ.
AD-616 075 FLD. 14

•ELECTRICAL IMPEDANCE
PLASMA JETS
MICROWAVE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN.
AD-616 121 FLD. 14

SPECIAL FUNCTIONS(MATHEMATICAL)
REPRINT: BOUNDS OF IMPEDANCE FUNCTIONS OF R, = L, = C, T NETWORKS.
AD-616 091 FLD. 9

•ELECTRICAL NETWORKS
SYNTHESIS
TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLICATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS.
AD-616 266 FLD. 9

THEORY
THE GYRATION OPERATOR IN NETWORK THEORY.
AD-616 329 FLD. 9

•ELECTROENCEPHOLOGRAPHY
CONDITIONED REFLEX
TRANSLATION OF RUSSIAN RESEARCH: CHANGES IN THE ELECTROENCEPHALOGRAM AND DERMA-GALVANIC REACTIONS IN THE PROCESS OF FORMATION OF TENTATIVE RELATIONSHIP BETWEEN MOTORIAL AND VISUAL ANALYZERS IN HUMANS.
AD-619 999 FLD. 5

•ELECTROLUMINESCENCE

VIEWING SCREENS
TRANSLATION OF RUSSIAN RESEARCH: ELEMENTS OF AN ELECTROLUMINESCENT SCREEN.
AD-616 268 FLD. 17

•ELECTROMAGNETIC FIELDS
THEORY
AD-616 217 FLD. 20

•ELECTROMAGNETIC PULSES
DETECTION
TRANSLATION OF RUSSIAN RESEARCH: DETECTION OF SIGNALS IN A STREAM OF PULSES.
AD-615 994 FLD. 17

KLYSTRONS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICRO WAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY.
AD-615 963 FLD. 9

PROPAGATION
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTR OMAGNETIC PULSE.
AD-615 927 FLD. 20

•ELECTROMAGNETIC SHIELDING
WEAPONS
PROPOSED FILTERED SHIELDED CONNECTOR FOR PROTECTION OF WEAPONS FROM ELECTROMAGNETIC RADIATION.
AD-616 304 FLD. 19

•ELECTROMAGNETIC WAVES
ENERGY CONVERSION
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
AD-616 336 FLD. 10

EXTREMELY LOW FREQUENCY
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION.
AD-615 972 FLD. 4

PROPAGATION
THE LONG YAGI-UDA ARRAY.
AD-615 803 FLD. 9
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE
REFLECTION SYMMETRY.
AD-615 827 FLD. 9

REFLECTION
TRANSLATION OF RUSSIAN RESEARCH: REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES.
AD-616 131 FLD. 20

SCATTERING
MIE SCATTERING AND ABSORPTION CROSS SECTIONS FOR ABSORBING PARTICLES.
AD-616 349 FLD. 20

•ELECTRON ACCELERATORS
LINEAR ACCELERATORS
HIGH CURRENT INVESTIGATION OF A 10 MEV S-BAND ELECTRON LINEAR ACCELERATOR.
AD-615 915 FLD. 18

•ELECTRON BEAMS
MICROWAVE FREQUENCY
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICRO WAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
AD-615 939 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGHPOWER ELECTRON BEAM AND PLASMA.
AD-615 940 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION.
AD-615 962 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICRO WAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY.
AD-615 963 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION.
AD-616 001 FLD. 9

•ELECTRON BOMBARDMENT
IONIZATION
THERMAL ELECTRON IMPACT IONIZATION RATE CALCULATION FOR H, H2, HE, N2, O2, NO2, AR, AND HG.
AD-615 888 FLD. 20

NUCLEAR CROSS SECTIONS
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 248 FLD. 18

•ELECTRON DENSITY
IONOSPHERE
AD-615 969 FLD. 4
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

•ELECTRON MICROSCOPES
PRISMS
TRANSLATION OF RUSSIAN PATENT: MAGNETOSTATIC PRISM FOR ADJUSTING OF ELECTRON MICROSCOPE.
AD-615 866 FLD. 14

•ELECTRON MICROSCOPY
CRYSTAL LATTICE DEFECTS
AD-616 352 FLD. 11

METAL FILMS
CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE.
AD-616 263 FLD. 11

MICROPHOTOGRAPHY
PREPARATION OF SUCCESSIVE REPLICAS FOR USE IN ELECTRON MICROSCOPY.
AD-616 340 FLD. 14

•ELECTRON SCATTERING
NUCLEAR CROSS SECTIONS
REPRINT: ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11.
AD-616 193 FLD. 20

•ELECTRONIC EQUIPMENT
RADIATION DAMAGE
STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION OF ELECTRONIC PARTS AND MATERIALS (SCORRE).
AD-616 007 FLD. 9

TRANSIENTS
REPRINT: TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS.
AD-616 176 FLD. 9

•ELECTRONICS
USSR
TRANSLATION OF RUSSIAN RESEARCH ON RADIO ENGINEERING AND ELECTRONICS.
AD-616 130 FLD. 20

•ELECTRONS
COSMIC RAYS
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963.
AD-616 297 FLD. 18

DENSITY
MICROWAVE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN.
AD-616 121 FLD. 14

GASES
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS.
AD-615 799 FLD. 20

INTENSITY
REPRINT: SURVEY OF ELECTRONS E > 40 KEV BEYOND 5 EARTH RADII WITH EXPLORER 14.
AD-616 172 FLD. 4
VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES.
AD-616 179 FLD. 4

SCATTERING
REPRINT: ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES.
AD-616 197 FLD. 20

•ELECTROSTATIC FIELDS
ATMOSPHERIC PRECIPITATION
THE MUTUAL ATTRACTION OF CLOUD DROPLETS IN THE ELECTRO STATIC FIELD OF THE ATMOSPHERE.
AD-616 379 FLD. 4

•ELEMENTARY PARTICLES
DEUTERONS
REPRINT: EVIDENCE THAT THE DEUTRON IS NOT AN ELEMENTARY PARTICLE.
AD-616 214 FLD. 20

ELECTROMAGNETISM
REPRINT: ELECTROMAGNETIC AND WEAK INTERACTIONS.
AD-616 050 FLD. 20

FIELD THEORY
REPRINT: FIELD THEORY OF MATTER; APPLICATION TO NONLEPTONIC PHENOMENA.
AD-616 182 FLD. 20

AD-616 217 FLD. 20

THEORY
REPRINT: GAUGE THEORY OF ELEMENTARY INTERACTIONS.
AD-616 059 FLD. 20

•EMBOLISM
BLOOD VESSELS
REPRINT: PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA.
AD-616 178 FLD. 6

•EMISSIVITY
BAND SPECTRUM
REPRINT: SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H2O.
AD-616 089 FLD. 20

•ENERGY
IONOSPHERIC PROPAGATION

REPRINT: SURVEY OF ELECTRONS E > 40 KEV BEYOND 5 EARTH RADII WITH EXPLORER 14.
AD-616 172 FLD. 4

•ENERGY CONVERSION
ELECTROMAGNETIC WAVES
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
AD-616 336 FLD. 10

MAGNETOHYDRODYNAMICS
MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMADYNAMIC POWER GENERATORS.
AD-616 260 FLD. 9

PLASMA MEDIUM
TRANSLATION OF RUSSIAN RESEARCH: LOW-TEMPERATURE PLASMA GENERATORS.
AD-616 310 FLD. 20

•ENTEROBACTERIACEAE
CULTURE MEDIA
REPRINT: SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM.
AD-616 136 FLD. 6

•ENZYMES
INTEGUMENTARY DISEASES
REPRINT: OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS.
AD-616 029 FLD. 6

PURIFICATION
REPRINT: LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE.
AD-616 069 FLD. 6

STIMULATION
REPRINT: STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES.
AD-616 169 FLD. 6

•EPOXY PLASTICS
ADDITIVES
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS LIQUID CHROMATOGRAPHY.
AD-615 959 FLD. 7

•EROSION
BEACHES
BEHAVIOR OF BEACH FILL AND BORROW AREA AT SEASIDE PARK, BRIDGEPORT, CONNECTICUT.
AD-615 791 FLD. 13

•ERYTHROCYTES
BLOOD TRANSFUSIONS
REPRINT: EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS.
AD-616 170 FLD. 6

GLUCOSE
REPRINT: THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE-RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS.
AD-616 073 FLD. 6

HEMATOLOGY

AD-616 393 FLD. 6

•EXCITATION
ATOMS
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

IODINE
REPRINT: LIFETIME OF THE EXCITED I(-) CENTER IN KCl.
AD-616 082 FLD. 20

•EXPANDED PLASTICS
FLOATS
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES.
AD-616 286 FLD. 13

•EXPLODING WIRES
ENERGY CONVERSION
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
AD-616 336 FLD. 10

•EXPLOSION EFFECTS
DEFORMATION
PLASTIC DEFORMATION OF BEAMS UNDER EXPLOSIVE STRESS.
AD-616 330 FLD. 19

•EXPLOSIVE MATERIALS
PHYSICAL PROPERTIES
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES.
AD-615 895 FLD. 19

•EXTRATERRESTRIAL RADIO WAVES
SOURCES
REPRINT: PROPERTIES OF MASSIVE OBJECTS; COLLAPSE OF STELLAR BODIES.
AD-616 191 FLD. 3

•FANS
NOISE
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVITION OF LIFT FAN NOISE.
AD-616 267 FLD. 1

•FATIGUE(MECHANICS)
FILMS
FATIGUE FAILURE OF SURFACE FILMS.
AD-616 291 FLD. 20

METALLIC CRYSTALS
MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 341 FLD. 20

•FEDERAL BUDGETS
NATIONAL DEFENSE
FEDERAL BUDGET AS AN INDICATOR OF GOVERNMENT INTENTIONS AND THE IMPLICATIONS OF INTENTIONS.
AD-616 367 FLD. 15

•FERMIONS
MATRIX ALGEBRA
REPRINT: MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS.
AD-616 219 FLD. 20

•FERRITES
MANUFACTURING METHODS
CONTROL AND REPRODUCIBILITY OF FERRITES PREPARED BY THE FLAME SPRAY-HOT PRESS TECHNIQUE.
AD-615 807 FLD. 11

•FERROCENES
SALTS
TRANSLATION OF RUSSIAN RESEARCH: ALPHA-FERROCENYL CARBONIUM SALTS.
AD-615 870 FLD. 7

•FERROELECTRIC MATERIALS
DIELECTRIC PROPERTIES
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
AD-615 930 FLD. 20

•FERROMAGNETIC MATERIALS
FILMS
REPRINT: SPATIAL VARIATION OF THE MAGNETIZATION ACROSS A FERROMAGNETIC THIN FILM IN THE BETHE-PEIERLS-WEISS APPROXIMATION.
AD-616 196 FLD. 20

•FIBER METALLURGY
SINGLE CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH. STRENGTH OF THIN METAL FIBERS.
AD-615 879 FLD. 20

•FIBERS(SYNTHETIC)
SCIENTIFIC RESEARCH
TRANSLATION OF RUSSIAN RESEARCH ON POLYACRYLONITRILE AND POLYAMIDE FIBERS FROM 'CHEMICAL FIBERS,' 1963, NO. 6.
AD-615 982 FLD. 11

•FIELD EMISSION
THEORY
REPRINT: THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION.
AD-616 202 FLD. 20

•FIELD THEORY
ELEMENTARY PARTICLES
REPRINT: FIELD THEORY OF MATTER; APPLICATION TO NONLEPTONIC PHENOMENA.
AD-616 182 FLD. 20

EXCITATION
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

NUCLEAR PHYSICS
REPRINT: BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS.
AD-616 183 FLD. 20

SPECIAL FUNCTIONS(MATHEMATICAL)
REPRINT: SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES.
AD-616 209 FLD. 20

•FILM COOLING
ROCKET MOTOR NOZZLES
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

•FILMS
GERMANIUM
INVESTIGATION OF ULTRA HIGH VACUUM SPUTTERED THIN FILMS.
AD-615 971 FLD. 20

PLASTICS
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS.
AD-615 881 FLD. 13

SPUTTERING

AD-615 808 FLD. 9

SURFACES
FATIGUE FAILURE OF SURFACE FILMS.
AD-616 291 FLD. 20

•FIRE EXTINGUISHERS
MATERIALS
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS.
AD-616 101 FLD. 11

•FLIGHT CONTROL SYSTEMS
SPACECRAFT
TRANSLATION OF RUSSIAN RESEARCH: OPTIMIZATION OF

FLIGHT CONTROL OF SPACECRAFT.
AD-615 858 FLD. 22

•FLIGHT SIMULATORS
SPACECRAFT DOCKING
MANNED CONTROL OF ORBITAL RENDEZVOUS.
AD-616 402 FLD. 22

•FLOATING BODIES
ICE
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION.
AD-616 313 FLD. 13

•FLOATS
BUOYANCY
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES.
AD-616 286 FLD. 13

•FLUIDS
VISCOELASTICITY
REPRINT: CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH APPLICATION TO RAPID EXTERNAL FLOWS.
AD-616 083 FLD. 20

•FLUTTER
CYLINDRICAL BODIES
FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
AD-616 321 FLD. 1

•FLUXES(FUSION)
SELECTION
TRANSLATION OF RUSSIAN RESEARCH: SELECTION OF FLUX FOR WELDING HIGH-STRENGTH STEEL.
AD-616 281 FLD. 13

•FOREIGN AID
INDIA
POSSIBLE U.S. POLICY TOWARDS INDIAN TRANSPORTATION: AN ILLUSTRATION OF IMPROVED SECTORAL POLICIES.
AD-615 947 FLD. 13

•FOUNDATIONS(STRUCTURES)
ICE
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION.
AD-616 313 FLD. 13

STEEL
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW.
AD-615 996 FLD. 13

•FRACTOGRAPHY
STEEL
TRANSLATION OF RUSSIAN RESEARCH. ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION.
AD-615 876 FLD. 11

•FRACTURE(MECHANICS)
ALLOYS
AD-615 786 FLD. 11

ALUMINUM ALLOYS
FRACTURE TOUGHNESS OF X7006-T6351 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
AD-615 781 FLD. 11

STEEL
TRANSLATION OF RUSSIAN RESEARCH. ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION.
AD-615 876 FLD. 11

•FREEZE DRYING
BEEF
INVESTIGATION INTO THE MECHANISM OF FREEZE DRYING.
AD-615 890 FLD. 6

•FREEZING
CYTOPLASM
REPRINT: EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES.
AD-616 226 FLD. 6

TISSUES(BIOLOGY)
REPRINT: STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTERATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING.
AD-616 024 FLD. 6

•FUEL ADDITIVES
ALUMINUM
REPRINT: STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION.
AD-616 143 FLD. 21

REVIEWS
TRANSLATION OF RUSSIAN RESEARCH: NEW ADDITIVES TO FUELS AND LUBRICANTS.
AD-616 312 FLD. 21

•FUEL CELLS
CONSTRUCTION
HYDROGEN-BROMINE FUEL CELL.
AD-616 108 FLD. 10

HYDROCARBONS
SATURATED HYDROCARBON FUEL CELL PROGRAM.
AD-615 885 FLD. 10

•FUNCTIONAL ANALYSIS
DIFFERENTIAL EQUATIONS
LINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS.
AD-615 806 FLD. 12

NUMERICAL METHODS AND PROCEDURES
ON THE SEPARATION OF EXPONENTIALS.
AD-616 410 FLD. 12

•FUNCTIONS
LINEAR SYSTEMS
AN EASY WAY TO DETERMINE THE SHAPE OF A DRIVING FUNCTION FROM THE RESPONSE OF A LINEAR SYSTEM.
AD-616 126 FLD. 14

THEOREMS
TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLICATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS.
AD-616 266 FLD. 9

•FURNACES
RESISTANCE(ELECTRICAL)
REPRINT: ELECTRIC FURNACE FOR OPERATION IN OXIDIZING, NEUTRAL, AND REDUCING ATMOSPHERES TO 2400 C.
AD-616 133 FLD. 14

•GALLIUM
CRYSTAL GROWTH
GROWTH OF DISLOCATION-FREE GALLIUM CRYSTALS.
AD-616 258 FLD. 20

•GALLIUM ALLOYS
ANTIMONY ALLOYS
REPRINT: OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX.
AD-616 184 FLD. 20

ARSENIC ALLOYS
REPRINT: RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

•GALVANIC SKIN RESPONSE
CONDITIONED REFLEX
TRANSLATION OF RUSSIAN RESEARCH: CHANGES IN THE ELECTROENCEPHALOGRAM AND DERMA-GALVANIC REACTIONS IN THE PROCESS OF FORMATION OF TENTATIVE RELATIONSHIP BETWEEN MOTORIAL AND VISUAL ANALYZERS IN HUMANS.
AD-615 995 FLD. 5

SLEEP
REPRINT: GALVANIC SKIN RESPONSE AFTER SLEEP DEPRIVATION.
AD-616 028 FLD. 5

•GAME THEORY
ARMED FORCES OPERATIONS
SOME MILITARY APPLICATIONS OF THE THEORY OF GAMES.
AD-616 413 FLD. 15

COMPUTERS
CHESS PLAYING BY MACHINE.
AD-616 376 FLD. 9

ECONOMICS
COMPOSITION OF GENERAL SUM GAMES.
AD-616 319 FLD. 5

PROGRAMMING(COMPUTERS)
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS.
AD-616 240 FLD. 9

SEARCH THEORY
SOME SPECIAL SEARCH PROBLEMS.
AD-616 377 FLD. 12

•GAMMA RAYS
NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN PATENT: AUTOMATIC GAMMA FLAW DETECTOR.
AD-615 992 FLD. 14

•GARNET
IMPURITIES
REPRINT: INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(3) ION IN LUTETIUM IRON GARNET.
AD-616 224 FLD. 20

•GAS BEARINGS
DESIGN
DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13
GAS BEARING DESIGN CHARTS. VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING.
AD-615 919 FLD. 13
GAS BEARING DESIGN CHARTS. VOLUME 2. THE HYDROSTATIC GAS JOURNAL BEARING AND THE HYDROSTATIC GAS THRUST BEARING.
AD-615 920 FLD. 13

•GAS FLOW
HEATING
CONSTRICTED TRANSPIRATION-COOLED ARCS FOR PRODUCING A GAS STREAM OF HIGH ENTHALPY.
AD-615 903 FLD. 20

MAGNETIC FIELDS
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE.

AD-619 780 FLD. 20

THEORY
THEORIES OF THERMAL TRANSPI RATION AND MOLECULAR EFFUSION.
AD-616 289 FLD. 1

•GAS IONIZATION
MEASUREMENT
REPRINT: BACKABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE.
AD-616 145 FLD. 14

NUCLEAR EXPLOSIONS
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT.
AD-619 938 FLD. 20

SPACE CHARGES
REPRINT: TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS.
AD-616 176 FLD. 9

•GASES
TRANSPORT PROPERTIES
REPRINT: AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL.
AD-616 229 FLD. 20

•GATES(CIRCUITS)
DIGITAL COMPUTERS
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS.
AD-616 117 FLD. 9

•GEODESICS
LASERS
RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS.
AD-619 912 FLD. 14

•GEOLOGY
CALIFORNIA
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA.
AD-616 397 FLD. 8

SEISMIC WAVES
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES.
AD-616 160 FLD. 8

•GEOPHYSICS
EQUATIONS OF STATE
REPRINT: CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE.
AD-616 168 FLD. 8

LAKES
GEOLOGY, MINERALOGY, AND HYDROLOGY OF U. S. PLAYAS.
AD-616 249 FLD. 8

PHYSICAL PROPERTIES
REPRINT: LATTICE DYNAMICS IN GEOPHYSICS.
AD-616 167 FLD. 8

PROGRAMMING(COMPUTERS)
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094).
AD-616 284 FLD. 8

REVIEWS
TRANSLATION OF CHINESE RESEARCH: ACTA GEOPHYSICA SINICA; CONTENTS AND ABSTRACT.
AD-616 114 FLD. 8

•GERMANIUM
ELECTRICAL PROPERTIES
INESTIGATION OF ULTRA HIGH VACUUM SPUTTERED THIN FILMS.
AD-619 971 FLD. 20

•GLASS
ELECTROMAGNETIC WAVES
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
AD-616 336 FLD. 10

INFRARED OPTICAL MATERIALS
HIGH-TEMPERATURE, INFRARED TRANSMITTING GLASSES.
AD-616 115 FLD. 11

PLATING
METHOD OF SILVER PLATING GLASS BEADS.
AD-619 880 FLD. 13

•GLIDERS
TRANSPORT PLANES
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM.
AD-619 908 FLD. 1

•GLUCOSE
BLOOD CHEMISTRY
REPRINT: BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS.
AD-616 159 FLD. 6

METABOLISM
REPRINT: THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE-RICH AND RETIC ULOCYTE-POOR HUMAN RED BLOOD CELLS.
AD-616 073 FLD. 6

•GOLD
INFRARED PROPERTIES
REPRINT: INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM.
AD-616 142 FLD. 20

POLAROGRAPHIC ANALYSIS
REPRINT: POLAROGRAPHIC DETERMINATION OF TRACES OF GOLD IN BLOOD AND SERUM.
AD-616 138 FLD. 6

•GOLD ALLOYS
CRYSTAL STRUCTURE
REPRINT: ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUM-GOLD (UBER DIE KRISTALLSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-GOLD UND RUBIDIUM-GOLD).
AD-616 059 FLD. 20

X-RAY DIFFRACTION ANALYSIS
LOCAL ORDER IN LIQUID ALLOYS.
AD-616 277 FLD. 11

•GRAIN BOUNDARIES
ZINC
REPRINT: GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS.
AD-616 049 FLD. 11

•GRANITE
MAGNETIC PROPERTIES
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA.
AD-616 397 FLD. 8

•GRAVITY
STARS
REPRINT: PROPERTIES OF MASSIVE OBJECTS; COLLAPSE OF STELLAR BODIES.
AD-616 191 FLD. 3

TRANSFORMATIONS(MATHEMATICS)

AD-616 217 FLD. 20

•GREAT BRITAIN
STRUCTURAL GEOLOGY
CRUSTAL STRUCTURE OF GREAT BRITAIN.
AD-616 093 FLD. 8

•GREEN'S FUNCTION
PLASMA OSCILLATIONS
REPRINT: QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD.
AD-616 042 FLD. 20

•GROUND EFFECT MACHINES
TESTS
TEST AND EVALUATION OF AN M-191 AIR CUSHION CONVERSION KIT.
AD-616 105 FLD. 1

•GROUP DYNAMICS
ADJUSTMENT(PSYCHOLOGY)
MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS.
AD-616 279 FLD. 5

BEHAVIOR
CONDITIONS AND OBSTACLES TO PARETO OPTIMALITY OF GROUP BEHAVIOR.
AD-616 290 FLD. 5

DECISION MAKING
FAMILY INTERACTION, COALITION, DISAGREEMENT, AND COMPROMISE IN PROBLEM, NORMAL, AND SYNTHETIC FAMILY TRIADS.
AD-619 766 FLD. 5

PERFORMANCE(HUMAN)
REPRINT: INDIVIDUAL TASK PERFORMANCE IN A CHANGING SOCIAL STRUCTURE.
AD-616 233 FLD. 5

SIMULATION
COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR.
AD-616 294 FLD. 5

SOCIOMETRICS
THREE STUDIES OF ORGANIZATIONAL AND INDIVIDUAL DIMENSIONS OF ORGANIZATIONS.
AD-619 796 FLD. 5

STRESS(PSYCHOLOGY)
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS.
AD-616 327 FLD. 5

STUDENTS
SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE.
AD-619 762 FLD. 5

VERBAL BEHAVIOR
RELATION BETWEEN TALING AND SOCIOMETRIC CHOICES.
AD-616 293 FLD. 5

•GROUPS(MATHEMATICS)
FIELD THEORY
REPRINT: CONCERNING SPACE-TIME AND SYMMETRY GROUPS.
AD-616 206 FLD. 20

•GUIDED MISSILE RANGES
NAVAL SHORE ESTABLISHMENTS
USER'S GUIDE TO THE EXPERIMENTAL SURFACE-LAUNCHED WEAPON-CONTROL TEST FACILITY.

AD-615 792 FLD. 14

•GUIDED MISSILES
CONTROL SYSTEMS
USER'S GUIDE TO THE EXPERIMENTAL SURFACE-LAUNCHED WEAPON-CONTROL TEST FACILITY.
AD-615 792 FLD. 14

LAUNCHING
MEASURING MISSILE RELIABILITY IN PRE-LAUNCH ENVIRONMENTS.
AD-616 383 FLD. 16

•GUIDED MISSILES(SURFACE-TO-SURFACE)
PAYLOAD
BALLISTIC MISSILE PAYLOAD ALLOCATION.
AD-616 405 FLD. 16

•GUIDED MISSILES(UNDERWATER-TOSURFACE)
SPARE PARTS
DEVELOPMENT OF USAGE RATE FOR SPARE PARTS OF FLEET BALLISTIC MISSILES.
AD-615 913 FLD. 15

•GYROSCOPES
INERTIAL GUIDANCE
INERTIAL GYROSCOPE TESTING: ADVANCED EQUIPMENT DESIGNS.
AD-616 006 FLD. 17

•HAFNIUM COMPOUNDS
IODIDES
REPRINT: MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES.
AD-616 211 FLD. 7

•HALIDES
CRYSTAL LATTICE DEFECTS
A FUNDAMENTAL STUDY OF DEFECT-DISLOCATION INTERACTION IN NACL TYPE LATTICES.
AD-615 974 FLD. 20

HALL EFFECT
REPRINT: ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

POTASSIUM COMPOUNDS
REPRINT: X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR.
AD-616 026 FLD. 20

•HALL EFFECT
TRANSIENTS
REPRINT: ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

•HALOGENATED HYDROCARBONS
CRYSTAL STRUCTURE
REPRINT: CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 033 FLD. 20

FIRE EXTINGUISHERS
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS.
AD-616 101 FLD. 11

MOLECULAR ASSOCIATION
REPRINT: SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS.
AD-616 147 FLD. 20

•HARDENING
CERAMIC MATERIALS
REPRINT: SOLID SOLUTION AND PRECIPITATION HARDENING IN MG-FE-O ALLOYS.
AD-616 046 FLD. 11

•HEARING
MEDICAL RESEARCH
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
AD-615 916 FLD. 6

THRESHOLDS(PHYSIOLOGY)
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER RIFLES.
AD-615 924 FLD. 6

•HEART
MECHANICAL ORGANS
REPRINT: EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION.
AD-616 134 FLD. 6

•HEAT TOLERANCE
ACCLIMATIZATION
REPRINT: TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN.
AD-616 164 FLD. 6

BODY FLUIDS
REPRINT: EFFECTS OF OVERHYD RATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT.
AD-616 165 FLD. 6

PILOTS
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•HEAT TRANSFER
SURFACES
THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPE RATURES.
AD-616 338 FLD. 20

•HEAT-RESISTANT MATERIALS
SILOXANES
NEW ORGANOBORANES: PREPARATION OF POLY-M-CARBORANYLENESILOXANES.
AD-615 819 FLD. 7

TESTS
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS.
AD-616 346 FLD. 11

•HEAT-RESISTANT PLASTICS
BENZIMIDAZOLES
TRANSLATION OF RUSSIAN RESEARCH. SYNTHESIS AND INVESTI GATION OF PROPERTIES OF CERTAIN HOMOGENEOUS AND MIXED POLYBENZ IMIDAZOLES.
AD-615 865 FLD. 11

•HEIGHT FINDING
AIR TRAFFIC CONTROL SYSTEMS
HEIGHT CODE TABLES FOR USE WITH AIR TRAFFIC CONTROL RADAR BEACON SYSTEM.
AD-615 818 FLD. 1

•HELICOPTERS
THRUST
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION.
AD-616 104 FLD. 1

TOWING VEHICLES
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM.
AD-615 908 FLD. 1

•HELIUM
COSMIC RAYS
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963.
AD-616 297 FLD. 18

LIQUEFIED GASES
REPRINT: BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS.
AD-616 022 FLD. 20
REPRINT: MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRE SENTATION OF CORRELATED BASIS FUNCTIONS.
AD-616 219 FLD. 20

SCATTERING
REPRINT: ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES.
AD-616 157 FLD. 20

STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 894 FLD. 16

•HELIUM GROUP GASES
PHOTOELECTRIC EFFECT
PHOTOIONIZATION OF KRYPTON AND ARGON IN THE 100-300 ANGSTROM RANGE.
AD-615 776 FLD. 18

PHYSIOLOGY
PHYSIOLOGICAL EFFECTS OF ARGON, HELIUM AND THE RARE GASES.
AD-615 814 FLD. 6

•HEMOLYSIS
ANTIGEN-ANTIBODY REACTIONS
REPRINT: STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS: APPLICATION TO THE ENUMERATION OF SAC'S.
AD-616 201 FLD. 6

•HEMOPOIETIC SYSTEM
AGING(PHYSIOLOGY)
REPRINT: NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOPOIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST.
AD-616 026 FLD. 6

BONE MARROW
AD-616 393 FLD. 6

•HEMORRHAGE
BLOOD DISEASES
REPRINT: RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS.
AD-616 177 FLD. 6

•HEPATITUS VIRUSES
TAIWAN
REPRINT: VIRAL HEPATITIS STUDY ON TAIWAN: REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962.
AD-615 851 FLD. 6

•HISTOLOGICAL TECHNIQUES
INTEGUMENTARY DISEASES
REPRINT: CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY.
AD-616 029 FLD. 6

•HORN ANTENNAS
ELECTROMAGNETIC PROPERTIES
ELECTROMAGNETIC PROPERTIES OF A PLASMA-COVERED ANTENNA.
AD-616 123 FLD. 9

•HOSPITALS
DATA PROCESSING SYSTEMS

INVESTIGATION OF EDP APPLICATIONS IN USAF HOSPITALS.
AD-616 362 FLD. 6

•HYBRID ROCKET PROPELLANTS
COMBUSTION
REPRINT: LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 892 FLD. 11

•HYDRAULIC FLUIDS
SYNTHESIS(CHEMISTRY)
AD-615 774 FLD. 11
AD-616 096 FLD. 11

•HYDRAZINE
LIPIDS
REPRINT: BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS.
AD-616 159 FLD. 6

•HYDROCARBONS
DEGRADATION
COMPARISON OF THE CAPABILITIES OF A FUEL COKER AND THE MINEX HEAT EXCHANGER FOR DETERMINING HYDROCARBON FUEL THERMAL STABILITY.
AD-616 361 FLD. 21

FUEL CELLS
SATURATED HYDROCARBON FUEL CELL PROGRAM.
AD-615 885 FLD. 10

•HYDRODYNAMICS
PROGRAMMING(COMPUTERS)
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS.
AD-615 801 FLD. 20

•HYDROGEN
COMBUSTION
EXPERIMENTAL INVESTIGATION OF STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN.
AD-615 798 FLD. 21

COSMIC RAYS
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963.
AD-616 297 FLD. 18

•HYDROGRAPHIC SURVEYING
MEXICO GULF
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
AD-616 276 FLD. 8

•HYPERFINE STRUCTURE
HYDROGEN
REPRINT: SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
AD-616 150 FLD. 20

X-RAY SPECTRUM
REPRINT: EXPERIMENTAL OBSERVATION OF ELECTRIC-QUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA.
AD-616 023 FLD. 20

•HYPERSONIC FLIGHT
AERODYNAMIC HEATING
AD-615 990 FLD. 20

•HYPERSONIC FLOW
BLUNT BODIES
NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
AD-615 901 FLD. 1

MATHEMATICAL ANALYSIS
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER.
AD-615 944 FLD. 1

NOSE CONES
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK.
AD-615 904 FLD. 1

SCIENTIFIC RESEARCH
AD-615 933 FLD. 1

•ICE
ARCTIC REGIONS
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1962.
AD-616 261 FLD. 8
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1961.
AD-616 262 FLD. 8

CONTROL
SNOW REMOVAL AND ICE CONTROL.
AD-615 795 FLD. 13

MECHANICS
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION.
AD-616 313 FLD. 13

SURFACE PROPERTIES
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE.
AD-616 315 FLD. 20

•IMMUNOLOGY
ANTIGEN-ANTIBODY REACTIONS
REPRINT: STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS; APPLICATION TO THE ENUMERATION OF SAC'S.
AD-616 201 FLD. 6

•IMPACT SHOCK
STRUCTURAL PARTS
TRANSLATION OF RUSSIAN RESEARCH. BEHAVIOR OF SHELLS AND PLATES UPON IMPACT.
AD-615 871 FLD. 20

•INDIA
TRANSPORTATION
POSSIBLE U.S. POLICY TOWARDS INDIAN TRANSPORTATION: AN ILLUSTRATION OF IMPROVED SECTORAL POLICIES.
AD-615 947 FLD. 13

•INDIUM
ISOMERIC TRANSITIONS
REPRINT: EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS.
AD-616 012 FLD. 20

•INDUSTRIAL PROCUREMENT
OPTIMIZATION
MULTI-LEVEL INVENTORY SYSTEMS: SPARE AIRCRAFT ENGINES.
AD-615 892 FLD. 15

•INDUSTRIAL PRODUCTION
QUALITY CONTROL
THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
AD-616 111 FLD. 13

USSR
AN INDEX OF SOVIET INDUSTRIAL OUTPUT.
AD-616 912 FLD. 5

•INDUSTRIES
FRANCE
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES.
AD-616 928 FLD. 5

•INEQUALITIES
SPECIAL FUNCTIONS(MATHEMATICAL)
REPRINT: A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL.
AD-615 898 FLD. 12

•INERTIAL GUIDANCE
GYROSCOPES
INERTIAL GYROSCOPE TESTING: ADVANCED EQUIPMENT DESIGNS.
AD-616 006 FLD. 17

SPACECRAFT
TRANSLATION OF RUSSIAN RESEARCH: THERMAL NOISE OF MEASURING DEVICES AND LIMITING ACCURACY SELF-CONTAINED GUIDANCE OF A SPACE SHIP.
AD-615 861 FLD. 22

•INFORMATION RETRIEVAL
MICROFILM
AD-615 800 FLD. 9

PROGRAMMING(COMPUTERS)
TEXTIR: A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM.
AD-615 763 FLD. 9

TEST METHODS
REPRINT: BASIC PARAMETERS OF RETRIEVAL TESTS.
AD-616 175 FLD. 9

•INFRARED DETECTORS
COOLING
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR.
AD-616 119 FLD. 13

•INFRARED OPTICAL MATERIALS
OPTICAL GLASS
HIGH-TEMPERATURE, INFRARED TRANSMITTING GLASSES.
AD-616 115 FLD. 11

•INFRARED RADIATION
REFLECTION
REPRINT: INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM.
AD-616 142 FLD. 20

•INFRARED SPECTROSCOPY
DIBASIC ACIDS
REPRINT: NORMAL COORDINATE ANALYSIS OF HYDROGEN-BONDED COMPOUNDS. THE ACID MALEATE ION.
AD-616 079 FLD. 7

•INFRARED WINDOWS
OPTICAL GLASS
HIGH-TEMPERATURE, INFRARED TRANSMITTING GLASSES.
AD-616 115 FLD. 11

•INSECT REPELLANTS
MUSCA
SENSORY RESPONSES OF THE HOUSE FLY, MUSCA DOMESTICA LINN., TO ATTRACTANTS.
AD-616 369 FLD. 6

•INSECTS
BIBLIOGRAPHIES
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6.
AD-616 003 FLD. 6

•INSTRUMENT LANDINGS

STANDARDS
ANALOG COMPUTER STUDY OF CATEGORY III INSTRUMENT LANDING SYSTEM AIRBORNE AND GROUND EQUIPMENT STANDARDS.
AD-616 005 FLD. 17

•INSTRUMENTATION
ABSTRACTING
TRANSDUCER INFORMATION CENTER: QUARTERLY ACCESSION LIST 8.
AD-616 328 FLD. 14

•INTEGRAL EQUATIONS
NEUTRON TRANSPORT THEORY
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE.
AD-616 403 FLD. 20
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

STRESSES
ANALYSIS OF FREE-FIELD DATA IN A HALF-SPACE UNDER DYNAMIC LOADS.
AD-615 906 FLD. 20

•INTEGRALS
INEQUALITIES
REPRINT: A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL.
AD-615 898 FLD. 12

•INTEGRATED CIRCUITS
PREPARATION

AD-615 808 FLD. 9

•INTEGUMENTARY DISEASES
ENZYMES
REPRINT: OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS.
AD-616 029 FLD. 6

THERAPY
REPRINT: CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY.
AD-616 029 FLD. 6

•INTERFERENCE ANALYZERS
MAGNETIC COILS
TRANSLATION OF RUSSIAN PATENT ON A DEVICE FOR COMPENSATING CONSTANT, INDUCTIVE AND MAGNETIC INTERFERENCES OF EDDY CURRENTS.
AD-615 987 FLD. 20

•INTERMETALLIC COMPOUNDS
ELECTRIC CURRENTS
REPRINT: OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX.
AD-616 184 FLD. 20

•INTERPLANETARY TRAJECTORIES
OPTIMIZATION
TRANSLATION OF RUSSIAN RESEARCH: OPTIMUM TWO-PULSE PASSAGE BETWEEN ORBITS WITH SMALL INCLINATIONS AND ECCENTRICITIES.
AD-616 282 FLD. 22

•INTERSTELLAR MATTER
ABSORPTION SPECTRUM
REPRINT: CHARGE TRANSFER ABSORPTION AS A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERSTELLAR GRAINS.
AD-616 227 FLD. 3

•INTEGRATORS
GATES(CIRCUITS)
REPRINT: GATED INTEGRATOR FOR REPETITIVE SIGNALS FOR PULSED NUCLEAR MAGNETIC RESONANCE SPECTROMETRY.
AD-616 222 FLD. 14

•INVARIANCE
DIFFERENTIAL EQUATIONS
DRAGGING ALONG AND INVARIANT DIFFERENTIATION.
AD-615 946 FLD. 12

•INVENTORY CONTROL
DATA PROCESSING SYSTEMS
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT.
AD-615 948 FLD. 15

LOGISTICS
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES.
AD-615 828 FLD. 15

OPTIMIZATION
MULTI-LEVEL INVENTORY SYSTEMS: SPARE AIRCRAFT ENGINES.
AD-615 892 FLD. 15

•IODINE
IONS
REPRINT: LIFETIME OF THE EXCITED I(-) CENTER IN KCL.
AD-616 082 FLD. 20

ISOMERIC TRANSITIONS
REPRINT: SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129.
AD-616 037 FLD. 20

•ION EXCHANGE
AIR
HEAVY ION EXCHANGE IN AIR: THEORY.
AD-616 109 FLD. 4

•IONIZATION
CESIUM
THE IONIZATION OF CESIUM IN TUNGSTEN CAPILLARIES.
AD-615 932 FLD. 7

GASES
THERMAL ELECTRON IMPACT IONIZATION RATE CALCULATION FOR H, H2, HE, N2, O2, NO2, AR, AND HG.
AD-615 888 FLD. 20

•IONIZATION GAGES
RADIATION DAMAGE
REPRINT: SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS.
AD-616 021 FLD. 14

•IONOSPHERE
ELECTRON DENSITY

AD-615 969 FLD. 4
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

LUXEMBERG EFFECT
MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964.
AD-615 764 FLD. 20

SCIENTIFIC RESEARCH
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

SHOCK WAVES
REPRINT: WEAK SHOCK WAVES IN THE IONOSPHERE.
AD-616 067 FLD. 4

TRANSPORT PROPERTIES
AERONOMIC COLLISIONS.
AD-615 970 FLD. 4

•IONOSPHERIC DISTURBANCES
CHEMICALS

AD-615 969 FLD. 4

ELECTRON DENSITY
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES.
AD-616 360 FLD. 4

POLAR REGIONS
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES.
AD-616 389 FLD. 4

•IONOSPHERIC PROPAGATION
ENERGY
REPRINT: SURVEY OF ELECTRONS E > 40 KEV BEYOND 5 EARTH RADII WITH EXPLORER 14.
AD-616 172 FLD. 4
VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES.
AD-616 179 FLD. 4

•IONS
CRYSTAL LATTICES

AD-616 092 FLD. 20

•IRON COMPOUNDS
ANTIFERROMAGNETISM
REPRINT: ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINSKY-MORIYA COUPLING; ORIENTATION DEPENDENCE IN ALPHA-FE2O3.
AD-616 173 FLD. 20

•ISOCYANATE PLASTICS
EXPANDED PLASTICS
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES.
AD-616 286 FLD. 13

PHOTOELASTICITY
MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS.
AD-616 249 FLD. 11
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 4485.
AD-616 391 FLD. 11

ROTARY WINGS
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
AD-616 128 FLD. 1

•ISOMERIC TRANSITIONS
ELECTRON BOMBARDMENT
REPRINT: EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS.
AD-616 012 FLD. 20

•ISOPRENE
CRYSTALLIZATION

AD-616 097 FLD. 11

•ITERATIVE METHODS
BOUNDARY VALUE PROBLEMS
SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS.
AD-616 301 FLD. 12

DIFFERENTIAL EQUATIONS
ON A PHASE METHOD FOR TREATING STURM-LIOUVILLE EQUATIONS AND PROBLEMS.
AD-616 373 FLD. 12

TRANSFORMATIONS(MATHEMATICAL)
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 916 FLD. 20

•JAPAN
CULTURE
REPRINT: JAPANESE VS. AMERICAN VALUES.
AD-616 196 FLD. 5

•JET ENGINE FUELS
STABILITY
COMPARISON OF THE CAPABILITIES OF A FUEL COKER AND THE MINEX HEAT EXCHANGER FOR DETERMINING HYDROCARBON FUEL THERMAL STABILITY.
AD-616 361 FLD. 21

•JET ENGINE NOISE
REDUCTION
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVITION OF LIFT FAN NOISE.
AD-616 267 FLD. 1

•JET ENGINES
TEST METHODS
PROCESSING OF ENGINE DATA FOR DEVELOPMENT OF TURBOJET ENGINE ANALYZER. PROCESSING OF J79-19 DATA FROM A 900 HOUR CELL TEST.
AD-616 300 FLD. 21

•JET PLANES
HELICOPTERS
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION.
AD-616 109 FLD. 1

•JETS
LAMINAR FLOW
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
AD-616 109 FLD. 1

MATHEMATICAL ANALYSIS
CURVED JET FLOWS.
AD-616 387 FLD. 1
CURVED JET FLOWS.
AD-616 395 FLD. 1

•JOB ANALYSIS
PERFORMANCE(HUMAN)
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
AD-615 921 FLD. 5

•JOINTS
NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN RESEARCH: WAYS FOR THE AUTOMATION OF NONDESTRUCTIVE WELD-JOINT INSPECTION METHODS.
AD-615 999 FLD. 13

WELDS
REPRINT: EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 039 FLD. 13

•JOURNAL BEARING
GAS BEARINGS
GAS BEARING DESIGN CHARTS. VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING.
AD-615 919 FLD. 13

•JOURNAL BEARINGS
GAS BEARINGS
DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13
GAS BEARING DESIGN CHARTS. VOLUME 2. THE HYDROSTATIC GAS JOURNAL BEARING AND THE HYDROSTATIC GAS THRUST BEARING.
AD-615 920 FLD. 13

HYDROSTATICS
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
AD-616 284 FLD. 13

•KINETIC THEORY
GASES
REPRINT: KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES.
AD-616 032 FLD. 20

IONOSPHERE
AERONOMIC COLLISIONS.
AD-615 970 FLD. 4

•KLYSTRONS
ELECTRON BEAMS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICRO WAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
AD-615 939 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION.
AD-615 962 FLD. 9

•LAMINAR FLOW
JETS
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
AD-616 109 FLD. 1

WATER
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE.
AD-616 315 FLD. 20

•LANDING MATS
ANCHORS(STRUCTURAL)
ANCHOR SYSTEMS FOR PREFABRICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS, ENGINEERING TESTS, MAY 1964.
AD-616 249 FLD. 1

•LANGUAGE
ANALYSIS
ASPECTS OF THE THEORY OF SYNTAX.
AD-616 323 FLD. 5
AUTOMATIC LANGUAGE-DATA PROCESSING IN SOCIOLOGY.
AD-616 424 FLD. 5

USSR
GUIDE TO RUSSIAN REFERENCE AND LANGUAGE AIDS: AN ANNOTATED BIBLIOGRAPHY.
AD-616 404 FLD. 5

•LASERS
ELECTRON BEAMS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION.
AD-616 001 FLD. 9

GEODESICS
RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS.
AD-615 912 FLD. 14

OSCILLATION
THEORETICAL RESEARCH ON LASER OSCILLATION.
AD-615 804 FLD. 20

SEMICONDUCTORS
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS.
AD-616 002 FLD. 20

STANDARDS
REPRINT: ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA.
AD-615 847 FLD. 5

•LAUNCHING
CHECKOUT PROCEDURES
MEASURING MISSILE RELIABILITY IN PRE-LAUNCH ENVIRONMENTS.
AD-616 383 FLD. 16

•LEADERSHIP
GROUP DYNAMICS
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS.
AD-616 327 FLD. 5

•LEAST SQUARES METHOD
NUMERICAL METHODS + PROCEDURES
REAL TIME COMPUTATION OF CONSTRAINED LEAST SQUARES ESTIMATORS.
AD-616 390 FLD. 12

SEISMOLOGY
REPRINT: A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETERMINATION USING S-WAVE DATA.
AD-615 840 FLD. 8
REPRINT: APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION.
AD-615 841 FLD. 8

•LEVARTERENOL
BLOOD PRESSURE
REPRINT: EFFECT OF L-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THEVALSALVA MANEUVER.
AD-615 843 FLD. 6

•LIBRARIES
AUTOMATION
ALPHA 1 (AUTOMATED LITERATURE PROCESSING, HANDLING, AND ANALYSIS SYSTEM): STATUS AT REDSTONE SCIENTIFIC INFORMATION CENTER.
AD-615 813 FLD. 5

•LIFE SUPPORT
WATER
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
AD-615 979 FLD. 6

•LIGHT
ABSORPTION
REPRINT: CHARGE TRANSFER ABSORPTION AS A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERSTELLAR GRAINS.
AD-616 227 FLD. 3

SCATTERING
SCATTERING OF LIGHT FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 190 FLD. 20

•LIMITED WAR
ANALYSIS
STRUCTURED APPROACH TO THE STUDY OF POLITICAL AND MILITARY ASPECTS OF LIMITED WAR; CONTEXTUAL STUDY.
AD-616 406 FLD. 5

•LIMITERS
NUCLEAR MAGNETIC RESONANCE
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 909 FLD. 17

•LINE SPECTRUM
RESONANCE
REPRINT: ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE.
AD-616 092 FLD. 20

•LINEAR ACCELERATORS
ELECTRON ACCELERATORS
HIGH CURRENT INVESTIGATION OF A 10 MEV S-BAND ELECTRON LINEAR ACCELERATOR.
AD-615 915 FLD. 18

•LIPIDS
HYDRAZINE
REPRINT: BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS.
AD-616 159 FLD. 6

•LIQUEFIED GASES
STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 894 FLD. 16

•LIQUID METALS
ATOMIC PROPERTIES
LOCAL ORDER IN LIQUID ALLOYS.
AD-616 277 FLD. 11

•LIQUID ROCKET PROPELLANTS
PROPELLANT TANKS
PROPELLANT CONTAINMENT UTILIZING SCREEN MESH AND PERFORATED PLATE SURFACES.
AD-616 317 FLD. 21

•LOADING(MECHANICS)
SURFACES
ANALYSIS OF FREE-FIELD DATA IN A HALF-SPACE UNDER DYNAMIC LOADS.
AD-615 906 FLD. 20

•LOGISTICS
AIR FORCE
LOGISTICS RESEARCH AND MANAGEMENT SCIENCE.
AD-616 926 FLD. 15

COSTS
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES.
AD-616 359 FLD. 13

INVENTORY CONTROL
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES.
AD-615 828 FLD. 15

WEAPON SYSTEMS
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING.
AD-616 378 FLD. 15

•LOUDSPEAKERS
RADIO COMMUNICATION SYSTEMS
TRANSLATION OF RUSSIAN PATENT ON AN ELECTRON TUBE FOR FIXING THE MAGNETIZATION OF PERMANENT MAGNETS OF RADIO DYNAMIC LOUDSPEAKERS.
AD-615 981 FLD. 17

•LUBRICANT ADDITIVES
REVIEWS
TRANSLATION OF RUSSIAN RESEARCH: NEW ADDITIVES TO FUELS AND LUBRICANTS.
AD-616 312 FLD. 21

•LUBRICATION
FLUID MECHANICS
REPRINT: VISCOUS FLOW BETWEEN ROTATING CONCENTRIC CYLINDERS WITH A CIRCUMFERENTIAL PRESSURE GRADIENT AT SPEEDS ABOVE CRITICAL.
AD-616 084 FLD. 20

•LUMINESCENCE
INFRARED SPECTROSCOPY
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 335 FLD. 7

•LUNAR ECLIPSES
SPACECRAFT
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT.
AD-615 949 FLD. 3

•MACHINE TOOLS
REINFORCED CONCRETE
APPLICATION OF REINFORCED CONCRETE IN HEAVY MACHINE BUILDING AND PRESS CONSTRUCTION.
AD-615 893 FLD. 13

•MAGNETIC FIELDS
INDUCTANCE
CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD.
AD-616 259 FLD. 8

INTENSITY
TRANSLATION OF RUSSIAN PATENT ON AN ELECTRON TUBE FOR FIXING THE MAGNETIZATION OF PERMANENT MAGNETS OF RADIO DYNAMIC LOUDSPEAKERS.
AD-615 981 FLD. 17

OSCILLATION
REPRINT: INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT.
AD-616 174 FLD. 20

•MAGNETIC MOMENTS
ANALYSIS
REPRINT: ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11.
AD-616 193 FLD. 20

•MAGNETIC PROPERTIES
CRYOGENICS
REPRINT: MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES.
AD-616 038 FLD. 20

FERROMAGNETIC MATERIALS
REPRINT: SPATIAL VARIATION OF THE MAGNETIZATION ACROSS A FERROMAGNETIC THIN FILM IN THE BETHE-PEIERLS-WEISS APPROXIMATION.
AD-616 146 FLD. 20

HAFNIUM COMPOUNDS
REPRINT: MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES.
AD-616 211 FLD. 7

MANGANESE ALLOYS
REPRINT: SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y).
AD-616 049 FLD. 20

SOLID STATE PHYSICS
REPRINT: HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID.
AD-616 220 FLD. 20

•MAGNETOHYDRODYNAMICS
COUETTE FLOW
VARIABLE CONDUCTIVITY MHD COUETTE FLOW.
AD-616 354 FLD. 20

GENERATORS
MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMADYNAMIC POWER GENERATORS.
AD-616 260 FLD. 9

ONE-DIMENSIONAL FLOW
ONE-DIMENSIONAL INVISCID MAGNETOHYDRODYNAMIC FLOW.
AD-616 398 FLD. 20

PARTICLE TRAJECTORIES
REPRINT: ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE.
AD-616 234 FLD. 20

SCIENTIFIC RESEARCH
AD-615 933 FLD. 1

STABILITY
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•MAGNETOMETERS
INTERFERENCE ANALYZERS
TRANSLATION OF RUSSIAN PATENT ON A DEVICE FOR COMPENSATING CONSTANT, INDUCTIVE AND MAGNETIC INTERFERENCES OF EDDY CURRENTS.
AD-615 987 FLD. 20

LOUDSPEAKERS
TRANSLATION OF RUSSIAN PATENT ON AN ELECTRON TUBE FOR FIXING THE MAGNETIZATION OF PERMANENT MAGNETS OF RADIO DYNAMIC LOUDSPEAKERS.
AD-615 981 FLD. 17

•MAGNETO-OPTIC EFFECT
PLASMA MEDIUM
REPRINT: MEASUREMENT OF THE FARADAY EFFECT IN A THETA PINCH PLASMA USING A HE-NE LASER.
AD-616 015 FLD. 20

RADAR SIGNALS
PREDICTION OF FARADAY ROTATION ANGLES AT VHF AND UHF.
AD-615 822 FLD. 20

•MAMMARY GLANDS
CANCER
REPRINT: HEMANGIOSARCOMA OF THE BREAST.
AD-616 027 FLD. 6

•MANAGEMENT CONTROL SYSTEMS
DATA PROCESSING SYSTEMS
INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM.
AD-616 241 FLD. 13

•MANAGEMENT ENGINEERING
AEROSPACE CRAFT
FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES.
AD-616 923 FLD. 13

AIR FORCE
LOGISTICS RESEARCH AND MANAGEMENT SCIENCE.
AD-616 926 FLD. 15

AIR FORCE PERSONNEL
CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES

AIR FORCE.
AD-616 326 FLD. 5

DECISION MAKING
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZATION.
AD-616 112 FLD. 13

•MANEUVERABILITY
AIRCRAFT
TRANSLATION OF RUSSIAN ARTICLE ON MANEUVERABILITY IN AIR TURBULENCE.
AD-619 993 FLD. 1

•MANGANESE ALLOYS
ARSENIC ALLOYS
REPRINT: SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y).
AD-616 093 FLD. 20

•MANGANESE COMPOUNDS
FLUORIDES
REPRINT: ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE.
AD-616 092 FLD. 20

•MANNED SPACECRAFT
CONTROL
MANNED CONTROL OF ORBITAL RENDEZVOUS.
AD-616 902 FLD. 22

MARS
VEHICLES FOR EXPLORATION ON MARS.
AD-616 907 FLD. 22

•MAPS
COLORS
THE COLOR PROBLEM.
AD-616 382 FLD. 8

•MARINE BIOLOGICAL LABORATORIES
SEA WATER
PACIFIC MARINE STATION SEA WATER SYSTEM.
AD-619 788 FLD. 14

•MARINE BORERS
PEST CONTROL
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS.
AD-619 779 FLD. 6

•MARINE GEOLOGY
OCEANOGRAPHIC VESSELS
REPRINT: DIVING SAUCER DESCENTS INTO SUBMARINE CANYONS.
AD-619 849 FLD. 8

SEISMIC WAVES
REPRINT: IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER.
AD-616 087 FLD. 8

•MARINE PROPULSION
VIBRATION
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY USS AUSTIN (LPD-4).
AD-616 237 FLD. 13

•MARS
MANNED SPACECRAFT
VEHICLES FOR EXPLORATION ON MARS.
AD-616 907 FLD. 22

•MASERS
GAIN
PHONON INTERACTIONS IN CRYSTALS.
AD-619 960 FLD. 20

HYDROGEN
REPRINT: SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
AD-616 190 FLD. 20

•MASS SPECTROSCOPY
TROPANE ALKALOIDS
TRANSLATION OF FRENCH RESEARCH: STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES.
AD-616 327 FLD. 7

•MATERIALS
BIBLIOGRAPHIES
DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS.
AD-616 389 FLD. 11

ENVIRONMENTAL TESTS
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
AD-619 769 FLD. 14

RADIATION DAMAGE
MONTHLY ACCESSION LIST. ABSTRACT NO. 27969 TO 27619, PART I.
AD-616 247 FLD. 18
MONTHLY ACCESSION LIST COORDINATE INDEX, PART II.
AD-616 248 FLD. 18

•MATHEMATICAL MODELS
COMMUNICATION THEORY
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS.
AD-616 113 FLD. 12

ELECTRICAL CORONA
REPRINT: A MODEL FOR STREAMER PROPAGATION.
AD-616 078 FLD. 20

RESPIRATORY SYSTEM
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM.
AD-616 372 FLD. 6

SEISMIC WAVES
SEISMIC PARTIAL COHERENCY STUDY.
AD-616 259 FLD. 17

•MATHEMATICAL PREDICTION
ERRORS
NEW COMPUTATIONAL DATA SMOOTHING PROCEDURE SUGGESTED BY MINIMUM MEAN SQUARE ERROR ESTIMATION.
AD-619 939 FLD. 14

ORBITAL TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL.
AD-619 899 FLD. 22

•MATHEMATICAL PROGRAMMING
PARTIAL DIFFERENTIAL EQUATIONS
LAPLACE'S EQUATION AND NETWORK FLOWS.
AD-619 819 FLD. 12

•MATHEMATICS
CIRCUITS
DIRECTIONS OF MATHEMATICAL RESEARCH IN NONLINEAR CIRCUIT THEORY.
AD-616 366 FLD. 9

•MATRIX ALGEBRA
ELECTRICAL NETWORKS
THE GYRATION OPERATOR IN NETWORK THEORY.
AD-616 329 FLD. 9

HELIUM
REPRINT: MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS.
AD-616 219 FLD. 20

•MECHANICAL ORGANS
BLOOD CIRCULATION
REPRINT: EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION.
AD-616 139 FLD. 6

•MECHANICAL WAVES
ATTENUATION
REPRINT: STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM.
AD-616 203 FLD. 20

REFLECTION
TRANSLATION OF RUSSIAN RESEARCH: REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES.
AD-616 131 FLD. 20

•MECHANICS
THEORY
REPRINT: IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS.
AD-616 200 FLD. 20

•MEMBRANES
EFFECTIVENESS
ANCHOR SYSTEMS FOR PREFABRICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964.
AD-616 249 FLD. 1

•MERCURY COMPOUNDS
DECOMPOSITION
REPRINT: EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL COMPONENT.
AD-616 187 FLD. 7

•MESON CROSS SECTIONS
OPERATORS(MATHEMATICS)
REPRINT: IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS.
AD-616 047 FLD. 20

PIONS
REPRINT: I=0 PION-PION AMPLITUDE AND SIGMA DI-PION.
AD-616 216 FLD. 20

•MESON SCATTERING
BARYONS
REPRINT: IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS.
AD-616 047 FLD. 20

•METABOLISM
ANOXIA
REPRINT: EFFECTS OF ANOXIA ON TISSUE METABOLISM.
AD-616 181 FLD. 6

•METAL COATINGS
GLASS
METHOD OF SILVER PLATING GLASS BEADS.
AD-619 880 FLD. 13

•METAL FILMS
DEFORMATION
CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE.
AD-616 263 FLD. 11

INFRARED PROPERTIES
REPRINT: INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM.
AD-616 142 FLD. 20

•METAL PLATES
IMPACT SHOCK
TRANSLATION OF RUSSIAN RESEARCH. BEHAVIOR OF SHELLS AND PLATES UPON IMPACT.
AD-615 871 FLD. 20

•METALLIC CRYSTALS
FIBER METALLURGY
TRANSLATION OF RUSSIAN RESEARCH. STRENGTH OF THIN METAL FIBERS.
AD-615 875 FLD. 20

•METALLURGY
BIBLIOGRAPHIES
DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS.
AD-616 389 FLD. 11

•METALORGANIC COMPOUNDS
DECOMPOSITION
REPRINT: EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL COMPONENT.
AD-616 187 FLD. 7

ZONE MELTING
ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY BIPHENYL.
AD-615 968 FLD. 13

•METALS
ATOMIC ENERGY LEVELS
REPRINT: INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT.
AD-616 174 FLD. 20

BIBLIOGRAPHIES
DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS.
AD-616 389 FLD. 11

SOLID STATE PHYSICS
REPRINT: LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS.
AD-616 088 FLD. 20

SURFACE PROPERTIES
THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPERATURES.
AD-616 338 FLD. 20

VAPORS
EFFECTS OF METAL VAPORS ON RADIATION HEAT TRANSFER CHARACTERISTICS OF ARC AND PLASMA SYSTEMS.
AD-616 110 FLD. 20

•METEOROLOGICAL INSTRUMENTS
BIBLIOGRAPHIES
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART II. BIBLIOGRAPHY.
AD-616 396 FLD. 4

PROBES(ELECTROMAGNETIC)
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
AD-616 347 FLD. 4

REVIEWS
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART I. ANALYSIS.
AD-616 355 FLD. 4

•METEOROLOGICAL PARAMETERS
MASSACHUSETTS
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, ESTIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
AD-616 394 FLD. 4

METEOROLOGICAL SATELLITES
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS.
AD-616 351 FLD. 4

•METEOROLOGICAL RADAR
ATMOSPHERIC PRECIPITATION
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
AD-615 772 FLD. 4

•METEOROLOGICAL SATELLITES
METEOROLOGICAL PARAMETERS
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS.
AD-616 351 FLD. 4

MONITORS
ATMOSPHERIC DENSITY DETERMINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
AD-615 924 FLD. 4

•METEOROLOGY
ABSTRACTS
ACTA METEOROLOGICA SINICA (CHINESE JOURNAL OF METEOROLOGY), V.34, NO.1, 1964: TABLE OF CONTENTS AND ABSTRACTS.
AD-615 956 FLD. 4

STRATOSPHERE
ASPECTS OF THE MIDDLE STRATOSPHERE.
AD-616 283 FLD. 4

•MICROBIOLOGY
INDEXES
REPRINT ACCESSION LIST 1964.
AD-616 280 FLD. 6

•MICROFILM
DOCUMENTATION
AD-615 800 FLD. 5

•MICROMINIATURIZATION(ELECTRONICS)
MODULES(ELECTRONICS)
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9

•MICROWAVE AMPLIFIERS
PLASMA PHYSICS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGHPOWER ELECTRON BEAM AND PLASMA.
AD-615 940 FLD. 9

TUNNEL DIODES
REPRINT: MICROWAVE TUNNEL DIODE AMPLIFIER.
AD-616 171 FLD. 9

•MICROWAVE EQUIPMENT
DIODES(SEMICONDUCTOR)
MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

ELECTRICAL DISCHARGES
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ.
AD-616 079 FLD. 14

•MICROWAVE SPECTROSCOPY
AMINES
IMPROVED STRUCTURAL CONFORMATION FOR TRIMETHYLAMINE.
AD-615 829 FLD. 7

•MILITARY MEDICINE
DATA PROCESSING SYSTEMS
INVESTIGATION OF EDP APPLICATIONS IN USAF HOSPITALS.
AD-616 362 FLD. 6

HEPATITUS VIRUSES
REPRINT: VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962.
AD-615 851 FLD. 6

•MILLIMETER WAVES
NOISE(RADIO)
NOISE SOURCE FOR MILLIMETER WAVELENGTH.
AD-616 274 FLD. 9

•MINERALS
DENSITY
REPRINT: RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
AD-616 166 FLD. 8

•MIRRORS
METAL FILMS
REPRINT: INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM.
AD-616 142 FLD. 20

•MODELS(SIMULATIONS)
DIGITAL COMPUTERS
REPRINT: DIGITAL SIMULATION AND MODELLING.
AD-615 831 FLD. 14

•MODULATORS
C BAND
C-BAND RECIPROCAL PHASE SHIFTERS AND AMPLITUDE MODULATORS.
AD-615 778 FLD. 9

•MODULES(ELECTRONICS)
MICROMINIATURIZATION(ELECTRONICS)
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9

•MOLECULAR ASSOCIATION
THERMOCHEMISTRY
REPRINT: SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS.
AD-616 147 FLD. 20

•MOLECULAR PROPERTIES
POLYMERS
STIFF MACROMOLECULES: I. MOLECULAR DIMENSIONS OF A WORMLIKE CHIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
AD-615 909 FLD. 11

•MOLECULAR STRUCTURE
AMINES
IMPROVED STRUCTURAL CONFORMATION FOR TRIMETHYLAMINE.
AD-615 829 FLD. 7

•MOLECULES
SCATTERING
SCATTERING OF X RAYS AND SLOW NEUTRONS FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 189 FLD. 20
SCATTERING OF LIGHT FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 190 FLD. 20

TRANSPORT PROPERTIES
REPRINT: AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL.
AD-616 225 FLD. 20

•MOLLUSCACIDES
EFFECTIVENESS
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS.

AD-619 775 FLD. 6

•MOLYBDENUM
FATIGUE(MECHANICS)

AD-616 392 FLD. 11

•MONOMOLECULAR FILMS
VISCOSITY
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

•MOSSBAUER EFFECT
IODINE
REPRINT: SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129.
AD-616 037 FLD. 20

•MOTIVATION
ADJUSTMENT(PSYCHOLOGY)
REPRINT: INDIVIDUAL TASK PERFORMANCE IN A CHANGING SOCIAL STRUCTURE.
AD-616 233 FLD. 5

•MUONS
HYPERFINE STRUCTURE
REPRINT: EXPERIMENTAL OBSERVATION OF ELECTRIC-QUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA.
AD-616 023 FLD. 20

•MUSCA
SENSORY PERCEPTION
SENSORY RESPONSES OF THE HOUSE FLY, MUSCA DOMESTICA LINN., TO ATTRACTANTS.
AD-616 364 FLD. 6

•NAVAL PERSONNEL
PSYCHOSES
REPRINT: OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE.
AD-616 152 FLD. 5

•NAVIGATION CHARTS
ARCTIC REGIONS
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1962.
AD-616 261 FLD. 8

•NAVY
MANAGEMENT ENGINEERING
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES.
AD-616 389 FLD. 13

•NEON
CRYSTAL LATTICES
REPRINT: A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XENON.
AD-616 212 FLD. 20

•NERVE CELLS
INTESTINES
REPRINT: KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE.
AD-616 139 FLD. 6

•NETWORKS
ELECTRICAL IMPEDANCE
REPRINT: BOUNDS OF IMPEDANCE FUNCTIONS OF R, = L, = C, T NETWORKS.
AD-616 091 FLD. 9

•NEUTRON TRANSPORT THEORY
INVARIANCE
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE.
AD-616 403 FLD. 20
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

•NICKEL
MAGNETIC PROPERTIES
REPRINT: MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES.
AD-616 038 FLD. 20

NUCLEAR ENERGY LEVELS
REPRINT: ON THE SECOND 2 LEVEL OF NI(58).
AD-616 199 FLD. 20

•NIOBIUM
SUPERCONDUCTIVITY
REPRINT: RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPERCONDUCTING NIOBIUM.
AD-616 020 FLD. 20

•NITROCELLULOSE
HYDRODYNAMICS
STIFF MACROMOLECULES: I. MOLECULAR DIMENSIONS OF A WORMLIKE CHIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
AD-619 909 FLD. 11

•NITROGEN
CHEMICAL REACTIONS
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 339 FLD. 7

STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-619 894 FLD. 16

•NITROGEN COMPOUNDS
GAS IONIZATION
REPRINT: BACKABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE.
AD-616 149 FLD. 14

MONOXIDES
REPRINT: NEAR-INFRARED EMISSION SPECTRUM OF NO.
AD-616 163 FLD. 20

•NOISE
CORRELATORS
REPRINT: EFFECT OF NOISE CROSSCORRELATION ON BINAURAL SIGNAL DETECTION.
AD-619 830 FLD. 17

•NOISE(RADIO)
MILLIMETER WAVES
NOISE SOURCE FOR MILLIMETER WAVELENGTH.
AD-616 274 FLD. 9

•NONLINEAR PROGRAMMING
FUNCTIONAL ANALYSIS
QUASI-CONCAVE PROGRAMMING.
AD-616 411 FLD. 5

•NONLINEAR SYSTEMS
STATISTICAL PROCESSES
SECOND ORDER PROPERTIES OF NONLINEAR SYSTEMS DRIVEN BY RANDOM NOISE.
AD-619 821 FLD. 12

•NON-DESTRUCTIVE TESTING
GAMMA RAYS
TRANSLATION OF RUSSIAN PATENT: AUTOMATIC GAMMA FLAW DETECTOR.
AD-619 992 FLD. 14

•NORTH AMERICA
STRUCTURAL GEOLOGY
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES.
AD-616 298 FLD. 8

•NOSE CONES
HYPERSONIC FLOW
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK.
AD-619 909 FLD. 1

•NUCLEAR BINDING ENERGY
PIONS
REPRINT: BINDING ENERGIES OF HYPERNUCLEI WITH MASS NUMBER A > 5.
AD-616 056 FLD. 20

•NUCLEAR ENERGY LEVELS
NICKEL
REPRINT: ON THE SECOND 2 LEVEL OF NI(58).
AD-616 199 FLD. 20

•NUCLEAR EXPLOSION DAMAGE
SHELTERS
DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY.
AD-619 779 FLD. 15

•NUCLEAR EXPLOSIONS
PROGRAMMING(COMPUTERS)
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS.
AD-619 801 FLD. 20

SITE SELECTION
GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS OF THE SAND SPRINGS RANGE, FAIRVIEW VALLEY, AND FOURMILE FLAT, CHURCHILL COUNTY, NEVADA.
AD-619 793 FLD. 14

•NUCLEAR MAGNETIC RESONANCE
CARBOXYLIC ACIDS
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACIDIRRDTD AT LOW THATURE.
AD-616 063 FLD. 20

SPECTRUM ANALYZERS
REPRINT: DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM.
AD-616 218 FLD. 20

TROPANE ALKALOIDS
TRANSLATION OF FRENCH RESEARCH: STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES.
AD-616 337 FLD. 7

•NUCLEAR MODELS
DIFFERENTIAL CROSS SECTION
REPRINT: EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS.
AD-616 080 FLD. 20

•NUCLEAR PROPULSION
MAGNETOHYDRODYNAMICS
REPRINT: NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO PHASE METAL VAPORS.
AD-616 162 FLD. 21

•NUCLEAR SPINS
MATRIX ALGEBRA
REPRINT: COVARIANT MERGING OF SPIN AND UNITARY SPIN.

AD-616 207 FLD. 20

•NUCLEAR STRUCTURE
SYMPOSIA
STRUCTURE OF LOW-MEDIUM MASS NUCLEI (PAPERS FROM A SYMPOSIUM).
AD-616 242 FLD. 20

•NUMBERS
PROGRAMMING(COMPUTERS)
FESTA COMPUTER SYSTEM FOR MANIPULATING SERIES OF NUMBERS WRITTEN ON MAGNETIC TAPE.
AD-616 009 FLD. 9

•NUMERICAL ANALYSIS
DATA
NEW COMPUTATIONAL DATA SMOOTHING PROCEDURE SUGGESTED BY MINIMUM MEAN SQUARE ERROR ESTIMATION.
AD-615 935 FLD. 14

•NUMERICAL METHODS + PROCEDURES
PARTIAL DIFFERENTIAL EQUATIONS
LAPLACE'S EQUATION AND NETWORK FLOWS.
AD-615 815 FLD. 12

•NUTRITION
AFRICA
ECOLOGY OF MALNUTRITION IN MIDDLE AFRICA (GHANA, NIGERIA, REPUBLIC OF THE CONGO, RWANDA BURUNDI, AND THE FORMER FRENCH EQUATORIAL AFRICA), VOLUME V.
AD-616 257 FLD. 6

•NYLON
ULTRAVIOLET RADIATION
TRANSLATION OF RUSSIAN RESEARCH: THE EFFECT OF ULTRA VIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS.
AD-616 283 FLD. 11

•N-BODY PROBLEM
PERTURBATION THEORY
REPRINT: VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY.
AD-616 057 FLD. 20

•N-HETEROCYCLIC COMPOUNDS
ORGANOBORANES
REPRINT: HETEROCYCLIC ORGANOBORON COMPOUNDS. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS.
AD-616 188 FLD. 7

•OCEANOGRAPHIC DATA
ANALYSIS
NARRATIVE OF CHAIN CRUISE NO. 43, 15 FEBRUARY-21 AUGUST 1964.
AD-616 392 FLD. 8

•OCEANOGRAPHIC EQUIPMENT
LIGHTING SYSTEMS
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE.
AD-616 287 FLD. 8

•OCEANOGRAPHIC VESSELS
INSTRUMENTATION
BATHYSCAPH TRIESTE TECHNOLOGICAL AND OPERATIONAL ASPECTS, 1958-1961.
AD-616 288 FLD. 8

MARINE GEOLOGY
REPRINT: DIVING SAUCER DESCENTS INTO SUBMARINE CANYONS.
AD-615 849 FLD. 8

NAVIGATIONAL AIDS
NARRATIVE CHAIN CRUISE NO. 38, 9-16 AUGUST 1963.
AD-615 878 FLD. 8

PHOTOGRAPHIC LIGHTING SYSTEMS
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE.
AD-616 287 FLD. 8

•OCEANOLOGY
BIBLIOGRAPHIES
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
AD-615 877 FLD. 8

MEXICO GULF
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
AD-616 276 FLD. 8

•OPERATIONS RESEARCH
AIRCRAFT INDUSTRY
FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES.
AD-616 429 FLD. 13

QUALITY CONTROL
THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPECTION BY ATTRIBUTES.
AD-615 797 FLD. 13

•OPERATORS(MATHEMATICS)
ELECTRICAL NETWORKS
THE GYRATION OPERATOR IN NETWORK THEORY.
AD-616 329 FLD. 9

MESON CROSS SECTIONS
REPRINT: IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS.
AD-616 047 FLD. 20

•OPTICAL GLASS
INFRARED OPTICAL MATERIALS
HIGH-TEMPERATURE, INFRARED TRANSMITTING GLASSES.
AD-616 115 FLD. 11

•OPTIMIZATION
CONTROL SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT.
AD-615 857 FLD. 22
TRANSLATION OF RUSSIAN RESEARCH: OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT.
AD-615 858 FLD. 22

THRUST
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER.
AD-615 862 FLD. 17

•ORBITAL TRAJECTORIES
DETERMINATION
TRANSLATION OF RUSSIAN RESEARCH: DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX.
AD-615 856 FLD. 22

SATELLITES(ARTIFICIAL)
TRANSLATION OF RUSSIAN ANALYSIS ON ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE.
AD-615 874 FLD. 16

SPACECRAFT
TRANSLATION OF RUSSIAN RESEARCH: PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL.
AD-615 859 FLD. 22

•ORGANOBORANES
POLYMERIZATION
NEW ORGANOBORANES: PREPARATION OF POLY-N-CARBORANYLENESILOXANES.
AD-615 819 FLD. 7

SYNTHESIS(CHEMISTRY)
SIX-BORON CARBORANES, (CH3)2C2B6H6 AND B6H10:P(C6H5)3 FROM HEXABORANE-10.
AD-615 959 FLD. 7
REPRINT: HETEROCYCLIC ORGANOBORON COMPOUNDS. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS.
AD-616 188 FLD. 7

•OXYGEN
CHEMICAL REACTIONS
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 339 FLD. 7

COMBUSTION
EXPERIMENTAL INVESTIGATION OF STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN.
AD-615 798 FLD. 21

STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 899 FLD. 14

•OZONE
ATMOSPHERE
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 250 FLD. 3
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE. REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 251 FLD. 3
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958.
AD-616 252 FLD. 3

MEASUREMENT
REPRINTS: (1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS.
AD-616 008 FLD. 4

STRATOSPHERE
ASPECTS OF THE MIDDLE STRATOSPHERE.
AD-616 253 FLD. 4

•PACKAGING
PLASTICS
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS.
AD-615 881 FLD. 13

•PAINTS
IDENTIFICATION
EXPERIMENTS IN THE IDENTIFI

CATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
AD-615 951 FLD. 14

•PALEONTOLOGY
PROGRAMMING(COMPUTERS)
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
AD-616 358 FLD. 8

•PANCREAS
ENZYMES
REPRINT: LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE.
AD-616 069 FLD. 6

TRANSPLANTATION
REPRINT: TRANSPLANTATION OF NEONATAL PANCREAS IN THYMEC TOMIZED HAMSTERS.
AD-616 085 FLD. 6

•PARAMAGNETIC MATERIALS
IONS

AD-616 052 FLD. 20

•PARAMAGNETIC RESONANCE
AMINO ACIDS
REPRINT: PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE.
AD-616 062 FLD. 7

CARBOXYLIC ACIDS
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACIDIRRDTD AT LOW TMATURE.
AD-616 069 FLD. 20

•PARENTERAL INFUSIONS
ANTIBIOTICS
REPRINT: PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN.
AD-616 137 FLD. 6

•PARTIAL DIFFERENTIAL EQUATIONS
ERRORS
REPRINT: DISCRETIZATION ERRORS FOR WELL-SET CAUCHY PROBLEMS.I.
AD-616 017 FLD. 12

INTEGRATION
ASYMPTOTIC BEHAVIOR OF SOLUTIONS OF LINEAR PARABOLIC EQUATIONS.
AD-616 927 FLD. 12

KINETIC THEORY
REPRINT: KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES.
AD-616 032 FLD. 20

NUMERICAL METHODS + PROCEDURES
LAPLACE'S EQUATION AND NETWORK FLOWS.
AD-615 815 FLD. 12

•PARTICLE TRAJECTORIES
INVARIANCE
REPRINT: ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE.
AD-616 234 FLD. 20

•PARTICLES
DRAG
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES.
AD-616 900 FLD. 1

•PASSENGER VEHICLES
ELECTRIC MOTORS
ELECTRIC MOTOR CARS.
AD-615 883 FLD. 13

•PAYLOAD
DISTRIBUTION
BALLISTIC MISSILE PAYLOAD ALLOCATION.
AD-616 409 FLD. 16

•PENICILLINS
BACILLUS ANTHRACIS
REPRINT: CHEMISTRY OF THE CELL WALLS OF BACILLUS ANTHRACIS: THE EFFECT OF PENIC ILLIN.
AD-616 198 FLD. 6

•PERITONEUM
ANTIBIOTICS
REPRINT: PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN.
AD-616 137 FLD. 6

•PERMAFROST
ALASKA
PEDO-ECOLOGICAL INVESTIGATIONS, BARROW, ALASKA.
AD-615 998 FLD. 8

CHARGES(EXPLOSIVES)
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61.
AD-616 314 FLD. 13

TERMINAL BALLISTICS
PENETRATION OF PROJECTILES INTO FROZEN GROUND.
AD-616 348 FLD. 19

•PERSONALITY
PSYCHOMETRICS
REPRINT: RELIABILITY OF PERSONALITY RATINGS UNDERVRIED ASSESSMENT CONDITIONS.
AD-616 148 FLD. 5

SOCIAL PSYCHOLOGY
WIT AND HUMOR, AN ANNOTATED BIBLIOGRAPHY.
AD-616 127 FLD. 5

•PERSONNEL MANAGEMENT
AIR FORCE
CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES AIR FORCE.
AD-616 326 FLD. 5

•PERTURBATION THEORY
DYNAMICS
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE.
AD-616 278 FLD. 12

N-BODY PROBLEM
REPRINT: VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY.
AD-616 097 FLD. 20

•PEST CONTROL
MARINE BORERS
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS.
AD-615 778 FLD. 6

•PETN
MIXTURES
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES.
AD-615 895 FLD. 19

•PETROLOGY
MAGNETISM
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
AD-616 358 FLD. 8

•PHASE SHIFTERS
C BAND
C-BAND RECIPROCAL PHASE SHIFTERS AND AMPLITUDE MODULATORS.
AD-615 778 FLD. 9

•PHASE STUDIES
METALORGANIC COMPOUNDS
ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY RIPHENYL.
AD-615 968 FLD. 13

TRANSFORMATIONS
REPRINT: ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS.
AD-616 161 FLD. 20

•PHONONS
CRYSTALS
PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

•PHOSPHATE COATINGS
PREPARATION
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE.
AD-616 308 FLD. 11

•PHOTOCONDUCTIVITY
CRYSTAL RECTIFIERS

AD-615 868 FLD. 9

•PHOTOELASTICITY
COATINGS

AD-615 990 FLD. 20

ISOCYANATE PLASTICS
MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS.
AD-616 349 FLD. 11
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 9485.
AD-616 391 FLD. 11

•PHOTOELECTRIC EFFECT
X RAYS
PHOTOIONIZATION OF KRYPTON AND ARGON IN THE 100-300 ANGSTROM RANGE.
AD-615 776 FLD. 18

•PHOTOGRAMMETRY
CUMULUS CLOUDS
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

•PHOTOGRAPHIC ANALYSIS
ELECTRICAL CORONA
REPRINT: THE VELOCITY OF STREAMER TIPS IN IMPULSE POINT TO-PLANE CORONA IN AIR, USING LICHTENBERG FIGURE TECHNIQUES.
AD-616 076 FLD. 20

•PHOTOGRAPHIC LIGHTING SYSTEMS
OCEANOGRAPHIC VESSELS
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE.
AD-616 287 FLD. 8

•PHYSICS
ABSTRACTING
ACTA PHYSICA SINICA (CHINESE JOURNAL OF PHYSICS), V.20, NO.1, 1964: TABLE OF CONTENTS AND ABSTRACTS.
AD-615 957 FLD. 20

•PHYSIOLOGY
HELIUM GROUP GASES
PHYSIOLOGICAL EFFECTS OF ARGON, HELIUM AND THE RARE GASES.
AD-615 814 FLD. 6

•PIGMENTS

CORROSION INHIBITION
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE.
AD-616 308 FLD. 11

•PILOTS
HEAT TOLERANCE
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•PIONS
MESON SCATTERING
REPRINT: I=0 PION-PION AMPLITUDE AND SIGMA DI-PION.
AD-616 216 FLD. 20

•PLASMA JETS
ELECTRICAL IMPEDANCE
MICROWAVE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN.
AD-616 121 FLD. 14

HEATING
CONSTRICTED TRANSPIRATION-COOLED ARCS FOR PRODUCING A GAS STREAM OF HIGH ENTHALPY.
AD-615 903 FLD. 20

•PLASMA MEDIUM
ELECTROMAGNETIC PROPERTIES
ELECTROMAGNETIC STUDIES IN SHOCK PRODUCED PLASMAS.
AD-616 272 FLD. 20

GAS FLOW
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE.
AD-615 780 FLD. 20

GENERATORS
TRANSLATION OF RUSSIAN RESEARCH: LOW-TEMPERATURE PLASMA GENERATORS.
AD-616 310 FLD. 20

MAGNETO-OPTIC EFFECT
REPRINT: MEASUREMENT OF THE FARADAY EFFECT IN A THETA PINCH PLASMA USING A HE-NE LASER.
AD-616 015 FLD. 20

QUANTUM MECHANICS
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS.
AD-615 799 FLD. 20

TEST EQUIPMENT
REPRINT: BACKABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE.
AD-616 145 FLD. 14

THERMODYNAMICS
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
AD-616 393 FLD. 20

VORTICES
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES.
AD-616 360 FLD. 4

•PLASMA OSCILLATIONS
QUANTUM MECHANICS
REPRINT: QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD.
AD-616 042 FLD. 20

•PLASMA PHYSICS
ABSORPTION SPECTRUM
EFFECTS OF METAL VAPORS ON RADIATION HEAT TRANSFER CHARACTERISTICS OF ARC AND PLASMA SYSTEMS.
AD-616 110 FLD. 20

ELECTRON BEAMS
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGHPOWER ELECTRON BEAM AND PLASMA.
AD-615 940 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

MAGNETIC FIELDS
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•PLASTIC COATINGS
ROTARY WINGS
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
AD-616 128 FLD. 1

•PLASTICS
PACKAGING
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS.
AD-615 881 FLD. 13

•PLATING
SILVER
METHOD OF SILVER PLATING GLASS BEADS.
AD-615 880 FLD. 13

•PLATINUM
THERMODYNAMICS
REPRINT: ANALYSIS OF THERMODYNAMIC DATA FOR PLATINUM AND PREDICTION OF THETA (DW) (T), THE DEBYE CHARACTERISTIC TEMPERATURE OF THE DEBYE-WELLER FACTOR.
AD-616 213 FLD. 20

•POLAR REGIONS
AURORAE
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES.
AD-616 384 FLD. 4

FOUNDATIONS(STRUCTURES)
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION.
AD-616 313 FLD. 13

TERMINAL BALLISTICS
PENETRATION OF PROJECTILES INTO FROZEN GROUND.
AD-616 348 FLD. 19

•POLITICAL SCIENCE
DETERRENCE
IS DETERRENCE ENOUGH OR SHOULD WE BE PREPARED TO FIGHT A GENERAL WAR IN THE 1960'S.
AD-616 414 FLD. 5

VENEZUELA
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY.
AD-615 910 FLD. 5

•POLYAMIDE PLASTICS
FIBERS(SYNTHETIC)
TRANSLATION OF RUSSIAN RESEARCH ON POLYACRYLONITRILE AND POLYAMIDE FIBERS FROM 'CHEMICAL FIBERS,' 1963, NO. 6.
AD-615 982 FLD. 11

SYNTHESIS(CHEMISTRY)
TRANSLATION OF RUSSIAN RESEARCH: DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN.
AD-615 991 FLD. 7

•POLYCYLLIC COMPOUNDS
MOLECULAR ASSOCIATION
REPRINT: SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS.
AD-616 147 FLD. 20

•POLYETHYLENE PLASTICS
PHYSICAL PROPERTIES
AD-616 097 FLD. 11
EVALUATION OF ETHYLENE PROPYLENE TERPOLYMER ELASTOMERS.
AD-616 322 FLD. 11

•POLYMERS
AROMATIC COMPOUNDS
INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3, 5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

DIFFUSION
REPRINT: ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS.
AD-616 161 FLD. 20

MOLECULAR STRUCTURE
STIFF MACROMOLECULES: I. MOLECULAR DIMENSIONS OF A WORMLIKE CHIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
AD-615 909 FLD. 11

AD-616 097 FLD. 11

PHYSICAL PROPERTIES
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
AD-615 966 FLD. 7

•POSITIONING REACTIONS
TELEVISION GUIDANCE
EFFECT OF AUGMENTED TELEVISION DEPTH CUES ON THE TERMINAL PHASE OF REMOTE DRIVING.
AD-615 929 FLD. 6

•POTASSIUM COMPOUNDS
COLOR CENTERS
REPRINT: X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR.
AD-616 036 FLD. 20

HALL EFFECT
REPRINT: ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

IODIDES
REPRINT: POLARIZED EMISSION FROM K:TL AT 12K.
AD-616 031 FLD. 20

•POTENTIAL THEORY
CALCULUS OF VARIATIONS
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY.
AD-616 099 FLD. 20

FIELD EMISSION
REPRINT: THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION.
AD-616 202 FLD. 20

PROBABILITY
LIMIT THEOREMS INVOLVING CAPACITIES FOR RECURRENT MARKOV CHAINS.
AD-615 950 FLD. 12

•POWER SUPPLIES
SPACECRAFT
SPACE VEHICLE POWER PLANTS.
AD-616 419 FLD. 22

•PRIMARY CELLS
ELECTROCHEMISTRY

AD-616 385 FLD. 10

•PRISMS
ELECTRON MICROSCOPES
TRANSLATION OF RUSSIAN PATENT: MAGNETOSTATIC PRISM FOR ADJUSTING OF ELECTRON MICROSCOPE.
AD-615 866 FLD. 14

•PROBABILITY
POTENTIAL THEORY
LIMIT THEOREMS INVOLVING CAPACITIES FOR RECURRENT MARKOV CHAINS.
AD-615 950 FLD. 12

•PROBES(ELECTROMAGNETIC)
NUCLEAR MAGNETIC RESONANCE
REPRINT: HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE.
AD-616 208 FLD. 14

•PRODUCTION CONTROL
ACCEPTABILITY
CRITERIA FOR ACCEPTANCE OF PRODUCTION MODELS OF EQUIPMENT.
AD-615 914 FLD. 13

GOVERNMENT(FOREIGN)
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES.
AD-616 428 FLD. 5

PUNCHED CARDS
INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM.
AD-616 241 FLD. 13

•PROGRAMMING(COMPUTERS)
ANALOG COMPUTERS
CONTINUOUS PROGRAMMING METHODS ON AN ANALOG COMPUTER.
AD-616 379 FLD. 9

CONDENSATION
DIGITAL COMPUTER PROGRAM FOR CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS.
AD-615 902 FLD. 1

GAME THEORY
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS.
AD-616 240 FLD. 9

HYDRODYNAMICS
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS.
AD-615 801 FLD. 20

INFORMATION RETRIEVAL
TEXTIR: A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM.
AD-615 763 FLD. 9

NUMBERS
FESTA COMPUTER SYSTEM FOR MANIPULATING SERIES OF NUMBERS WRITTEN ON MAGNETIC TAPE.
AD-616 004 FLD. 9

PALEONTOLOGY
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
AD-616 358 FLD. 8

PHOTOGRAMMETRY
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

PSEUDO-RANDOM SYSTEMS
NIP (NAREC INTERPRETIVE PROGRAMMING): FLOATING-POINT SYSTEM.
AD-615 811 FLD. 9

SEISMOLOGY
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094).
AD-616 294 FLD. 8

SHIELDING
A COMPUTER PROGRAM INCORPORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIATION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
AD-616 106 FLD. 9

UNDERWATER SOUND
COMPUTER STUDY OF UNDERWATER SOUND RAYS AND REFRACTION EFFECTS.
AD-615 777 FLD. 20

•PROJECTILES
PENETRATION
PENETRATION OF PROJECTILES INTO FROZEN GROUND.
AD-616 348 FLD. 19

•PROTHROMBIN
TEST METHODS
REPRINT: SPECTROPHOTOMETRIC MODIFICATION OF THE TAME ASSAY FOR PROTHROMBIN.
AD-616 180 FLD. 6

•PROTONS
COSMIC RAYS
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963.
AD-616 297 FLD. 18

RADIATION MEASUREMENT SYSTEMS
GAMMA SCANNING OF SATAR SATELLITE BL-412.
AD-615 925 FLD. 22

•PSEUDO-RANDOM SYSTEMS
PROGRAMMING(COMPUTERS)
NIP (NAREC INTERPRETIVE PROGRAMMING): FLOATING-POINT SYSTEM.
AD-615 811 FLD. 9

TELEVISION DISPLAY SYSTEMS
PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
AD-616 279 FLD. 17

•PSYCHIATRY
NAVAL PERSONNEL
REPRINT: OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE.
AD-616 152 FLD. 5

THEORY
THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY.
AD-616 334 FLD. 5

•PSYCHOLOGY
BIBLIOGRAPHIES
WIT AND HUMOR. AN ANNOTATED BIBLIOGRAPHY.
AD-616 127 FLD. 5

THEORY
THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY.
AD-616 334 FLD. 5

•PSYCHOMETRICS
RELIABILITY
REPRINT: RELIABILITY OF PERSONALITY RATINGS UNDERVRIED ASSESSMENT CONDITIONS.
AD-616 148 FLD. 5

•PSYCHOSES
NAVAL PERSONNEL
REPRINT: OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE.
AD-616 152 FLD. 5

•PUBLIC OPINION
USSR
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW.
AD-616 417 FLD. 5

•PULSE GENERATORS
TRANSMISSION LINES
DESIGN CONSIDERATIONS FOR TRANSMISSION LINES AND PULSE FORMING NETWORKS.
AD-615 824 FLD. 9

•PULSE INTEGRATORS
SIGNALS
REPRINT: GATED INTEGRATOR FOR REPETITIVE SIGNALS FOR PULSED NUCLEAR MAGNETIC RESONANCE SPECTROMETRY.
AD-616 222 FLD. 14

•PULSE MODULATION
DATA TRANSMISSION SYSTEMS
APPLICATION OF MONOCYCLE POSITON MODULATION TO THE TRANSMISSION OF BINARY DIGITAL DATA.
AD-615 969 FLD. 9

•QUALITY CONTROL
INDUSTRIAL PRODUCTION
THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
AD-616 111 FLD. 13

MILITARY REQUIREMENTS
THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPECTION BY ATTRIBUTES.
AD-615 797 FLD. 13

•QUANTUM MECHANICS
LASERS
THEORETICAL RESEARCH ON LASER OSCILLATION.
AD-615 804 FLD. 20

PLASMA OSCILLATIONS
REPRINT: QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD.
AD-616 042 FLD. 20

•QUARTZ
CRYSTAL GROWTH
SYNTHETIC QUARTZ PILOT PLANT.
AD-615 896 FLD. 13
SYNTHETIC QUARTZ.
AD-615 897 FLD. 13

STRESSES
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-615 810 FLD. 20

•QUARTZ RESONATORS
MANUFACTURING METHODS

QUARTZ CRYSTAL UNIT CR-(XM-37)/U.
AD-616 256 FLD. 9

•RADAR BEACONS
AIR TRAFFIC CONTROL SYSTEMS
HEIGHT CODE TABLES FOR USE WITH AIR TRAFFIC CONTROL RADAR BEACON SYSTEM.
AD-615 818 FLD. 1

•RADAR SIGNALS
IONOSPHERE
PREDICTION OF FARADAY ROTATION ANGLES AT VHF AND UHF.
AD-615 822 FLD. 20

•RADAR TARGETS
RESOLUTION
THE RESOLVABILITY OF POINT SOURCES.
AD-616 420 FLD. 17

•RADIATION CHEMISTRY
ALKENES
TRANSLATION OF RUSSIAN RESEARCH: RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF TICL4.
AD-615 983 FLD. 7

•RADIATION DAMAGE
ELECTROMAGNETIC WAVES
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION.
AD-616 336 FLD. 10

ELECTRONIC EQUIPMENT
STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION OF ELECTRONIC PARTS AND MATERIALS (SCORRE).
AD-616 007 FLD. 9

INDEXES
MONTHLY ACCESSION LIST COORDINATE INDEX, PART II.
AD-616 248 FLD. 18

MATERIALS
MONTHLY ACCESSION LIST. ABSTRACT NO. 27565 TO 27614, PART I.
AD-616 247 FLD. 18

NUCLEAR CROSS SECTIONS
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

SEMICONDUCTORS
REPRINT: RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

TRANSISTORS
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-616 000 FLD. 9
REPRINT: SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS.
AD-616 021 FLD. 14

•RADIATION EFFECTS
HEMOPOIETIC SYSTEM

AD-616 393 FLD. 6

•RADIATION MEASUREMENT SYSTEMS
SATELLITES(ARTIFICIAL)
GAMMA SCANNING OF SATAR SATELLITE WL-912.
AD-615 925 FLD. 22

•RADIATION MONITORS
CIVIL DEFENSE SYSTEMS
RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER.
AD-615 911 FLD. 15

•RADIO ANTIJAMMING
LIMITERS
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 905 FLD. 17

•RADIO COMMUNICATION SYSTEMS
DATA TRANSMISSION SYSTEMS
DATA TRANSMISSION INVESTIGATION (SHORT RANGE HF RADIO DATA TRANSMISSION).
AD-615 975 FLD. 17

TRANSMITTER-RECEIVERS
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
AD-615 959 FLD. 17

•RADIO INTERFERENCE
LIMITERS
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 905 FLD. 17

•RADIO TRANSMISSION
UNDERGROUND ANTENNAS
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN.
AD-615 794 FLD. 20

•RADIO TRANSMITTERS
GAS BEARINGS
DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13

•RADIO WAVES
ATTENUATION
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTROMAGNETIC PULSE.
AD-615 937 FLD. 20

IONOSPHERIC PROPAGATION
MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964.
AD-615 769 FLD. 20

PROPAGATION
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA.
AD-615 785 FLD. 20
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES.
AD-615 936 FLD. 20
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT.
AD-615 938 FLD. 20
TRANSLATION OF RUSSIAN RESEARCH ON RADIO ENGINEERING AND ELECTRONICS.
AD-616 130 FLD. 20

•RADIOFREQUENCY POWER
MICROWAVE FREQUENCY
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
AD-615 939 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGHPOWER ELECTRON BEAM AND PLASMA.
AD-615 940 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION.
AD-615 962 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY.
AD-615 963 FLD. 9
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION.
AD-616 001 FLD. 9

STANDARDS
A STANDARD ARMY MICROWAVE POWER CALIBRATION SYSTEM FOR THE 26.5 TO 40 GIGACYCLE RANGE.
AD-616 270 FLD. 14

•RADIOFREQUENCY PULSES
MEASUREMENT
REPRINT: AMPLITUDE AND DECAY RATE ANALYSIS OF LOW LEVEL EXPONENTIALLY DECAYING RADIO-FREQUENCY SIGNALS.
AD-616 149 FLD. 9

•RADIOSONDES
TESTS
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
AD-616 247 FLD. 4

•RAINDROPS
MODELS(SIMULATIONS)
DYNAMIC SIMILARITY AND THE MODELING OF CLOUD DROPLETS.
AD-616 399 FLD. 8

•RATIONAL NUMBERS
TRANSCENDENTAL FUNCTIONS
THE RATIONAL POINTS ON A TRANSCENDENTAL CURVE.
AD-616 401 FLD. 12

•RDX
MIXTURES
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES.
AD-615 895 FLD. 19

•REAL VARIABLES
THEOREMS
REPRINT: A STRONG LAW FOR THE MAXIMUM CUMULATIVE SUM OF INDEPENDENT RANDOM VARIABLES.
AD-616 199 FLD. 12

•REENTRY VEHICLES
HEAT-RESISTANT MATERIALS
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS.
AD-616 346 FLD. 11

•REFLECTION
MECHANICAL WAVES
TRANSLATION OF RUSSIAN RESEARCH: REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES.
AD-616 131 FLD. 20

•REFRACTIVE INDEX
MINERALS
REPRINT: RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
AD-616 166 FLD. 8

•REFRIGERATION SYSTEMS
INFRARED DETECTORS
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR.
AD-616 119 FLD. 13

•REINFORCED CONCRETE
FOUNDATIONS(STRUCTURES)
APPLICATION OF REINFORCED

CONCRETE IN HEAVY MACHINE BUILDING AND PRESS CONSTRUCTION.
AD-615 853 FLD. 13

•REINFORCING MATERIALS
CERAMIC FIBERS
BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-615 817 FLD. 11

FATIGUE(MECHANICS)
REPRINT: FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 035 FLD. 13

•RELATIVITY THEORY
FIELD THEORY
REPRINT: CONCERNING SPACE-TIME AND SYMMETRY GROUPS.
AD-616 206 FLD. 20

•RELAXATION TIME
RIBONUCLEASE
REPRINT: RELAXATION SPECTRA OF RIBONUCLEASE.
AD-616 011 FLD. 7

•RELIABILITY(ELECTRONICS)
RESISTORS
RELIABLE LONG LIFE COMPONENT STUDY XLT METAL FILM RESISTOR.
AD-615 977 FLD. 9

•RENDEZVOUS GUIDANCE
ASCENT TRAJECTORIES
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS.
AD-616 422 FLD. 22

•RENDEZVOUS SPACECRAFT
ORBITAL TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION.
AD-615 855 FLD. 22

•RENDEZVOUS TRAJECTORIES
SIMULATION
MANNED CONTROL OF ORBITAL RENDEZVOUS.
AD-616 402 FLD. 22

TERMINAL GUIDANCE
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS.
AD-616 422 FLD. 22

•RESEARCH PLANES
TEST FACILITIES
MARVEL PROJECT: A UNIQUE SOLUTION TO THE PROBLEM OF OBTAINING TWO-DIMENSIONAL BOUNDARY LAYER DATA ON THE VARIABLE-CAMBER HIGH-LIFT WINGS OF THE MARVELETTE AIRCRAFT.
AD-615 928 FLD. 1

•RESISTANCE(ELECTRICAL)
NICKEL
REPRINT: MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES.
AD-616 038 FLD. 20

NIOBIUM
REPRINT: RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM.
AD-616 020 FLD. 20

•RESISTORS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9

METAL FILMS
RELIABLE LONG LIFE COMPONENT STUDY XLT METAL FILM RESISTOR.
AD-615 977 FLD. 9

•RESOLUTION
RADAR TARGETS
THE RESOLVABILITY OF POINT SOURCES.
AD-616 420 FLD. 17

•RESPIRATION
CARBON DIOXIDE
CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
AD-615 967 FLD. 6

•RESPIRATORY SYSTEM
MATHEMATICAL MODELS
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM.
AD-616 372 FLD. 6

•RHODIUM
ISOMERIC TRANSITIONS
REPRINT: EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS.
AD-616 012 FLD. 20

•RIBONUCLEASE
MOLECULAR SPECTROSCOPY
REPRINT: RELAXATION SPECTRA OF RIBONUCLEASE.
AD-616 011 FLD. 7

•ROCK SALT
GRAIN BOUNDARIES
REPRINT: ENERGY OF GRAIN BOUNDARIES IN HALITE.
AD-616 049 FLD. 11

•ROCKET CASES
SOLID ROCKET PROPELLANTS
EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•ROCKET MOTOR NOZZLES
FILM COOLING
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

THERMODYNAMICS
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID PROPELLANT ROCKET ENGINE.
AD-616 129 FLD. 21

•ROCKET MOTORS(LIQUID PROPELLANT)
PERFORMANCE(ENGINEERING)
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID PROPELLANT ROCKET ENGINE.
AD-616 129 FLD. 21

TURBOPUMPS
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
AD-616 284 FLD. 13

•ROCKET PROPELLANT GRAINS
SURFACE PROPERTIES
EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•ROCKET PROPELLANTS
COMBUSTION
EXPERIMENTAL INVESTIGATION OF STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN.
AD-615 798 FLD. 21

STANDARDS
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 899 FLD. 14

•ROCKET TRAJECTORIES
CORRECTIONS
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER.
AD-615 862 FLD. 17

•ROCK(GEOLOGY)
MAGNETIC PROPERTIES
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
AD-616 398 FLD. 8
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA.
AD-616 397 FLD. 8

PENETRATION
REPRINT: CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH.
AD-616 019 FLD. 8

SOUTHERN HEMISPHERE
REPRINT: SOUTHERN HEMISPHERE BEACH ROCK.
AD-616 231 FLD. 8

WAVE TRANSMISSION
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA.
AD-615 785 FLD. 20

•ROTARY WINGS
ISOCYANATE PLASTICS
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
AD-616 128 FLD. 1

•ROTATION
DAMPING
THEORY OF THE UNSYMMETRIC NUTATION DAMPER.
AD-615 889 FLD. 20
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
AD-616 118 FLD. 22

SATELLITES(ARTIFICIAL)
TRANSLATION OF RUSSIAN RESEARCH: ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE.
AD-615 860 FLD. 22

•ROTOR BLADES(ROTARY WINGS)
AERODYNAMIC LOADING
EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
AD-615 922 FLD. 1

•RUBY
LASERS
REPRINT: ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA.
AD-615 847 FLD. 9

•SALIVA
DENTISTRY

REPRINT: REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE.
AD-616 030 FLD. 6

•SALMONELLA
CULTURE MEDIA
REPRINT: SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM.
AD-616 136 FLD. 6

•SAND
STATICS
ANGLE OF REPOSE OF A SINGLE GRAIN (SAND) ON A FIXED ROUGH BED.
AD-615 787 FLD. 8

•SANDWICH CONSTRUCTION
STRUCTURAL PROPERTIES
SANDWICH SHELL THEORY.
AD-615 945 FLD. 13

•SATELLITES(ARTIFICIAL)
ASTRONOMICAL DATA
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT.
AD-615 949 FLD. 3

ORBITAL TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX.
AD-615 856 FLD. 22
TRANSLATION OF RUSSIAN ANALYSIS ON ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE.
AD-615 874 FLD. 16

PHOTOGRAPHY
TRANSLATION OF RUSSIAN PATENT: ARRANGEMENT FOR PHOTO GRAPHING ARTIFICIAL EARTH SATELLITES.
AD-616 307 FLD. 22

RADIATION MEASUREMENT SYSTEMS
GAMMA SCANNING OF SATAR SATELLITE WL-412.
AD-615 925 FLD. 22

ROTATION
TRANSLATION OF RUSSIAN RESEARCH: ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE.
AD-615 860 FLD. 22

USSR
TRANSLATION OF RUSSIAN ARTICLE: LABORATORIES IN SPACE.
AD-615 986 FLD. 22

•SCIENTIFIC RESEARCH
USSR
FOREIGN SCIENCE BULLETIN, VOL. 1, NO. 6, 1965.
AD-615 879 FLD. 5

•SCIENTIFIC SATELLITES
STABILITY
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
AD-616 118 FLD. 22

USSR
TRANSLATION OF RUSSIAN ARTICLE: LABORATORIES IN SPACE.
AD-615 986 FLD. 22

•SEA WATER
MARINE BIOLOGICAL LABORATORIES
PACIFIC MARINE STATION SEA WATER SYSTEM.
AD-615 788 FLD. 14

MATERIALS
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
AD-615 769 FLD. 14

•SEARCH THEORY
GAME THEORY
SOME SPECIAL SEARCH PROBLEMS.
AD-616 377 FLD. 12

REALIBILITY
OPTIMUM SEARCH ROUTINES FOR AUTOMATIC FAULT LOCATION.
AD-616 419 FLD. 14

•SEDIMENTARY ROCK
CLIMATOLOGY
TRANSLATION OF RUSSIAN RESEARCH: IS THE BRIKNER (BRUECKNER) CYCLE REAL.
AD-615 768 FLD. 4

•SEISMIC WAVES
DATA
SEISMIC PARTIAL COHERENCY STUDY.
AD-616 255 FLD. 17

GEOLOGY
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES.
AD-616 160 FLD. 8

MARINE GEOLOGY
REPRINT: IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER.
AD-616 087 FLD. 8

NEW JERSEY
REPRINT: SEISMIC WAVES WITH FREQUENCIES FROM 1 TO 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY.
AD-615 834 FLD. 8

VELOCITY
REPRINT: TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE.
AD-615 838 FLD. 8
REPRINT: CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE.
AD-616 168 FLD. 8

•SEISMOGRAPHS
SYNTHESIS
REPRINT: AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES.
AD-615 842 FLD. 8

•SEISMOLOGY
GREAT BRITAIN
CRUSTAL STRUCTURE OF GREAT BRITAIN.
AD-616 093 FLD. 8

NORTH AMERICA
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES.
AD-616 298 FLD. 8

PROGRAMMING(COMPUTERS)
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094).
AD-616 294 FLD. 8

SPAIN
REPRINT: CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION.
AD-616 016 FLD. 8

•SEMICONDUCTING FILMS
PHYSICAL PROPERTIES
NEW SOLID-STATE DEVICE CONCEPTS.
AD-616 390 FLD. 20

•SEMICONDUCTORS
CATALYSIS
TRANSLATION OF RUSSIAN TRANSLATION: CATALYSIS ON AN ORGANIC SEMICONDUCTOR MADE FROM POLYACRYLONITRILE.
AD-615 989 FLD. 7

FILMS
INESTIGATION OF ULTRA HIGH VACUUM SPUTTERED THIN FILMS.
AD-615 971 FLD. 20

LASERS
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS.
AD-616 002 FLD. 20

MATERIALS
NEW SOLID-STATE DEVICE CONCEPTS.
AD-616 390 FLD. 20

RADIATION DAMAGE

AD-615 868 FLD. 9
REPRINT: RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

STRAIN GAGES
USE OF SEMICONDUCTOR STRAIN GAGES.
AD-615 802 FLD. 14

ULTRASONIC RADIATION
REPRINT: OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX.
AD-616 184 FLD. 20

•SENSORY MECHANISMS
STIMULATION
TRANSLATION OF RUSSIAN RESEARCH: OPPOSITE CHANGES IN ELECTROPHYSIOLOGICAL REACTIONS OF THE HUMAN BRAIN IN ADOPTING THE FREQUENCY OF LIGHT FLASHES AT VESTIBULAR AND OPTOKINETIC STIMULI.
AD-616 311 FLD. 6

•SHAPED CHARGE JETS
PENETRATION
REPRINT: CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH.
AD-616 019 FLD. 8

•SHEAR STRESSES
FATIGUE(MECHANICS)
FATIGUE FAILURE OF SURFACE FILMS.
AD-616 291 FLD. 20

•SHELTERS
NUCLEAR EXPLOSION DAMAGE
DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY.
AD-615 779 FLD. 15

•SHIGELLA
CULTURE MEDIA
REPRINT: SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM.
AD-616 136 FLD. 6

•SHIP HULLS
VIBRATION
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY

USS AUSTIN (LPD-4).
AD-616 227 FLD. 13

•SHIP STRUCTURAL COMPONENTS
OCEANOGRAPHIC VESSELS
BATHYSCAPH TRIESTE TECHNOLOGICAL AND OPERATIONAL ASPECTS, 1958-1961.
AD-616 288 FLD. 8

•SHOCK WAVES
IONOSPHERE
REPRINT: WEAK SHOCK WAVES IN THE IONOSPHERE.
AD-616 067 FLD. 4

PROGRAMMING(COMPUTERS)
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS.
AD-615 801 FLD. 20

PROPAGATION
TRANSLATION OF RUSSIAN RESEARCH: STUDYING SHOCK WAVE PROPAGATION IN THE SOIL.
AD-615 867 FLD. 8

UNDERWATER EXPLOSIONS
REPRINT: ENERGY PER UNIT-AREA SPECTRUM OF THE SHOCK WAVE FROM 1-LB TNT CHARGES EXPLODED UNDERWATER.
AD-616 154 FLD. 19

•SILOXANES
POLYMERIZATION
NEW ORGANOBORANES: PREPARATION OF POLY-M-CARBORANYLENESILOXANES.
AD-615 819 FLD. 7

•SILVER
INFRARED PROPERTIES
REPRINT: INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM.
AD-616 142 FLD. 20

PLATING
METHOD OF SILVER PLATING GLASS BEADS.
AD-615 880 FLD. 13

•SIMULATION
DIGITAL COMPUTERS
REPRINT: DIGITAL SIMULATION AND MODELLING.
AD-615 831 FLD. 14

•SINGLE CRYSTALS
FATIGUE(MECHANICS)
MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 241 FLD. 20

FIBER METALLURGY
TRANSLATION OF RUSSIAN RESEARCH. STRENGTH OF THIN METAL FIBERS.
AD-615 879 FLD. 20

TUNGSTEN COMPOUNDS
REPRINT: SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE.
AD-616 209 FLD. 20

•SINTERING
TESTS
USE OF REACTIVE ATMOSPHERES FOR THE TREATMENT OF B.C.C. METALS.
AD-616 273 FLD. 13

•SKIN
ENZYMES
REPRINT: OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS.
AD-616 029 FLD. 6

•SKY BRIGHTNESS
MEASUREMENT
THE EQUATORIAL AIRGLOW.
AD-616 249 FLD. 3

•SLEEP
GALVANIC SKIN RESPONSE
REPRINT: GALVANIC SKIN RESPONSE AFTER SLEEP DEPRIVATION.
AD-616 028 FLD. 5

•SLENDER BODIES
FLUTTER
FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
AD-616 321 FLD. 1

HYPERSONIC FLOW
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER.
AD-615 949 FLD. 1

•SMALL ARMS
NOISE
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER RIFLES.
AD-615 934 FLD. 6

•SNOW
HARDNESS
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW.
AD-615 997 FLD. 14

•SNOW REMOVAL
TRANSPORTATION
SNOW REMOVAL AND ICE CONTROL.
AD-615 795 FLD. 13

•SOCIAL COMMUNICATION
ADJUSTMENT(PSYCHOLOGY)
MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS.
AD-616 279 FLD. 5

•SOCIAL PSYCHOLOGY
BIBLIOGRAPHIES
BIBLIOGRAPHY OF PUBLICATIONS RELATING TO THE SMALL GROUP.
AD-616 269 FLD. 5

•SOCIOLOGY
DATA PROCESSING SYSTEMS
AUTOMATIC LANGUAGE-DATA PROCESSING IN SOCIOLOGY.
AD-616 424 FLD. 5

•SOCIOMETRICS
GROUP DYNAMICS
FAMILY INTERACTION, COALITION, DISAGREEMENT, AND COMPROMISE IN PROBLEM, NORMAL, AND SYNTHETIC FAMILY TRIADS.
AD-615 766 FLD. 5
THREE STUDIES OF ORGANIZATIONAL AND INDIVIDUAL DIMENSIONS OF ORGANIZATIONS.
AD-615 796 FLD. 5
CONDITIONS AND OBSTACLES TO PARETO OPTIMALITY OF GROUP BEHAVIOR.
AD-616 290 FLD. 5

STUDENTS
SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE.
AD-615 762 FLD. 5

VERBAL BEHAVIOR
RELATION BETWEEN TALING AND SOCIOMETRIC CHOICES.
AD-616 293 FLD. 5

•SODIUM
CRYSTAL STRUCTURE
REPRINT: ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM.
AD-616 221 FLD. 20

NUCLEAR MAGNETIC RESONANCE
REPRINT: DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM.
AD-616 218 FLD. 20

•SODIUM COMPOUNDS
HALL EFFECT
REPRINT: ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

IODIDES
REPRINT: LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTITUTIONAL MASS DEFECTS IN SODIUM IODIDE.
AD-616 098 FLD. 20

TUNGSTATES
REPRINT: SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES.
AD-616 059 FLD. 20

•SOILS
ALASKA
PEDO-ECOLOGICAL INVESTIGATIONS, BARROW, ALASKA.
AD-615 998 FLD. 8

SHOCK WAVES
TRANSLATION OF RUSSIAN RESEARCH: STUDYING SHOCK WAVE PROPAGATION IN THE SOIL.
AD-615 867 FLD. 8

•SOLAR ECLIPSES
IONOSPHERIC DISTURBANCES
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

SPACECRAFT
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT.
AD-615 949 FLD. 3

•SOLAR WIND
SIMULATION
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE.
AD-615 780 FLD. 20

•SOLID ROCKET PROPELLANTS
BURNING RATE
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

COMBUSTION
REPRINT: STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION.
AD-616 143 FLD. 21

STRESSES
EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•SOLID STATE PHYSICS
MAGNETIC PROPERTIES
REPRINT: HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID.
AD-616 220 FLD. 20

TUNGSTEN COMPOUNDS
REPRINT: SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE.
AD-616 209 FLD. 20

•SOLIDIFIED GASES
CRYSTAL LATTICES
REPRINT: A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XENON.
AD-616 212 FLD. 20

MECHANICAL PROPERTIES
REPRINT: THE SHEAR STRENGTHS OF SOME SOLIDIFIED GASES.
AD-616 071 FLD. 7

•SOLIDS
SURFACE PROPERTIES
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE.
AD-616 116 FLD. 7

•SONAR
SOUND TRANSMISSION
SOUND REFLECTION AND SCATTERING BY THE OCEAN BOUNDARIES.
AD-615 918 FLD. 17

•SONAR EQUIPMENT
ACOUSTIC IMPEDANCE
EFFECT OF THEVENIN EQUIVALENT INTERNAL IMPEDANCE ON VELOCITY CONTROL AND ACOUSTIC POWER FOR PLANAR BROADSIDE ARRAYS FOR DIFFERENT DRIVING LEVEL LIMITATIONS.
AD-615 773 FLD. 17

MARINE GEOPHYSICS
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
AD-615 877 FLD. 8

•SORPTION
THERMODYNAMICS
REPRINT: ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS.
AD-616 161 FLD. 20

•SOUND
SURFACES
REPRINT: ACOUSTIC WAVE MOTION ALONG A PERIODIC SURFACE.
AD-616 060 FLD. 20

•SOUND TRANSMISSION
SCATTERING
SOUND REFLECTION AND SCATTERING BY THE OCEAN BOUNDARIES.
AD-615 918 FLD. 17

•SPACE CHARGES
MOTION
REPRINT: TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS.
AD-616 176 FLD. 9

•SPACE CREWS
PHYSIOLOGY
INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS.
AD-616 316 FLD. 6

•SPACE ENVIRONMENTAL CONDITIONS
PROGRAMMING(COMPUTERS)
A COMPUTER PROGRAM INCORPORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIATION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
AD-616 106 FLD. 9

•SPACE FLIGHT
OPTIMIZATION
TRANSLATION OF RUSSIAN RESEARCH: OPTIMUM TWO-PULSE PASSAGE BETWEEN ORBITS WITH SMALL INCLINATIONS AND ECCENTRICITIES.
AD-616 282 FLD. 22

REPORTS
TRANSLATIONS OF EXCERPTS FROM THE LOGBOOKS KEPT BY THE RUSSIAN COSMONAUTS V. BYKOVSKIY AND T. TERESHKOVA.
AD-615 988 FLD. 16

•SPACE MEDICINE
TELEMETER SYSTEMS
INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS.
AD-616 316 FLD. 6

•SPACE NAVIGATION
POSITION FINDING
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

•SPACE STATIONS
RENDEZVOUS SPACECRAFT
TRANSLATION OF RUSSIAN RESEARCH: CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION.
AD-615 855 FLD. 22

•SPACECRAFT
ATTITUDE CONTROL SYSTEMS
REPRINT: VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
AD-616 185 FLD. 22

CONTROL SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: CERTAIN PROBLEMS OF OPTIMUM CONTROL OF THREE DIMENSIONAL MOTION OF SPACE VEHICLES.
AD-615 854 FLD. 22
TRANSLATION OF RUSSIAN RESEARCH: SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT.
AD-615 857 FLD. 22
TRANSLATION OF RUSSIAN RESEARCH: OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT.
AD-615 858 FLD. 22
TRANSLATION OF RUSSIAN RESEARCH: PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL.
AD-615 859 FLD. 22

COOLING
NUMERICAL SOLUTION FOR HEAT CONDUCTION IN A SOLID WITH A RECEDING SURFACE.
AD-616 196 FLD. 22

INERTIAL GUIDANCE
TRANSLATION OF RUSSIAN RESEARCH: THERMAL NOISE OF MEASURING DEVICES AND LIMITING ACCURACY SELF-CONTAINED GUIDANCE OF A SPACE SHIP.
AD-615 861 FLD. 22

POWER SUPPLIES
SPACE VEHICLE POWER PLANTS.
AD-616 419 FLD. 22

•SPACECRAFT DOCKING
FLIGHT SIMULATORS
MANNED CONTROL OF ORBITAL RENDEZVOUS.
AD-616 402 FLD. 22

•SPAIN
STRUCTURAL GEOLOGY
REPRINT: CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION.
AD-616 016 FLD. 8

•SPAR BUOYS
MOTION
MOTION OF A SPAR BUOY IN SWELL. PART I.
AD-615 882 FLD. 13
THE MOTION OF SPAR BUOY IN SWELL. PART II.
AD-615 884 FLD. 13

•SPARE PARTS
INVENTORY ANALYSIS
DEVELOPMENT OF USAGE RATE FOR SPARE PARTS OF FLEET BALLISTIC MISSILES.
AD-615 913 FLD. 15

•SPECIAL FUNCTIONS(MATHEMATICAL)
EXCITATION
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

FIELD THEORY
REPRINT: SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES.
AD-616 205 FLD. 20

INEQUALITIES
REPRINT: A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL.
AD-615 848 FLD. 12

PROPAGATION
REPRINT: BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS.
AD-616 183 FLD. 20

SWITCHING CIRCUITS
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC.
AD-616 325 FLD. 9

•SPECIAL PURPOSE COMPUTERS
DATA PROCESSING SYSTEMS
JOSS: EXPERIENCE WITH AN EXPERIMENTAL COMPUTING SERVICE FOR USERS AT REMOTE TYPEWRITER CONSOLES.
AD-615 943 FLD. 9

•SPECIFIC HEAT
METALS
REPRINT: LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS.
AD-616 088 FLD. 20

•SPECTRA(INFRARED)
NITROGEN COMPOUNDS
REPRINT: NEAR-INFRARED EMISSION SPECTRUM OF NO.
AD-616 163 FLD. 20

•SPECTROSCOPY
PAINTS
EXPERIMENTS IN THE IDENTIFICATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
AD-615 951 FLD. 14

•SPECTRUM ANALYZERS
INTEGRATORS
REPRINT: GATED INTEGRATOR FOR REPETITIVE SIGNALS FOR PULSED NUCLEAR MAGNETIC RESONANCE SPECTROMETRY.
AD-616 222 FLD. 14

NUCLEAR MAGNETIC RESONANCE
REPRINT: DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM.
AD-616 218 FLD. 20

•SPHERES
DRAG
DRAG COEFFICIENTS OF SMALL,

IRREGULAR PARTICLES.
AD-616 400 FLD. 1

WAVE TRANSMISSION
SPHERICAL WAVES IN VISCOELASTIC MEDIA.
AD-615 999 FLD. 20

•SPIN
QUENCHING(INHIBITION)
REPRINT: SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y).
AD-616 093 FLD. 20

TRANSFORMATIONS(MATHEMATICS)

AD-616 217 FLD. 20

•SPINELS
MAGNETIC PROPERTIES
REPRINT: MAGNETIC PROPERTIES OF V3 IONS IN CUBIC SPINELS.
AD-616 091 FLD. 8

•SPUTTERING
INTEGRATED CIRCUITS

AD-615 808 FLD. 9

•STAGNATION POINT
TURBULENCE
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION.
AD-616 102 FLD. 1

•STANDARDS
INTENSITY
REPRINT: ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA.
AD-615 847 FLD. 8

•STARS
GRAVITY
REPRINT: PROPERTIES OF MASSIVE OBJECTS: COLLAPSE OF STELLAR BODIES.
AD-616 191 FLD. 3

•STATISTICAL ANALYSIS
PROGRAMMING(COMPUTERS)
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094).
AD-616 294 FLD. 8

WEATHER FORECASTING
EXTENSIONS TO THEORY OF TIME-SERIES ANALYSIS.
AD-616 329 FLD. 12

•STATISTICAL DISTRIBUTIONS
DISTRIBUTION THEORY
PARAMETER-FREE AND NONPARAMETRIC TOLERANCE LIMITS: THE EXPONENTIAL CASE.
AD-616 269 FLD. 12

TABLES
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(RIN,P) FOR LARGE N AND SMALL P.
AD-616 270 FLD. 12

•STATISTICAL MECHANICS
SCATTERING
SCATTERING OF X RAYS AND SLOW NEUTRONS FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 189 FLD. 20
SCATTERING OF LIGHT FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 190 FLD. 20

•STATISTICAL PROCESSES
DECISION THEORY
FUNCTIONAL EQUATIONS IN THE THEORY OF DYNAMIC PROGRAMMING. XI: LIMIT THEOREMS.
AD-616 408 FLD. 12

NONLINEAR SYSTEMS
SECOND ORDER PROPERTIES OF NONLINEAR SYSTEMS DRIVEN BY RANDOM NOISE.
AD-615 821 FLD. 12

•STEEL
BRITTLENESS
EMBRITTLEMENT OF METALS BY ORGANIC LIQUIDS.
AD-616 302 FLD. 11

CORROSION INHIBITION
CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS.
AD-615 941 FLD. 11

FRACTURE(MECHANICS)

AD-615 786 FLD. 11

METALLOGRAPHY
TRANSLATION OF RUSSIAN RESEARCH. ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION.
AD-615 876 FLD. 11

SURFACE PROPERTIES
DETECTION AND EVALUATION OF SURFACE DECARBURIZATION OF STEEL COMPONENTS BY MEANS OF ROCKWELL HARDNESS TEST PROCEDURES.
AD-615 823 FLD. 11

•STEROIDS
OXIDATION
REPRINT: STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES.
AD-616 169 FLD. 6

•STOCHASTIC PROCESSES
INPUT-OUTPUT DEVICES
REPRINT: REDUCED FORMS FOR STOCHASTIC SEQUENTIAL MACHINES.
AD-616 199 FLD. 9

•STOCK LEVEL CONTROL
LOGISTICS
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES.
AD-615 828 FLD. 15

•STRAIN GAGES
FOUNDATIONS(STRUCTURES)
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW.
AD-615 996 FLD. 13

GRAPHITE
GRAPHITE MONOPARTICULATE LAYER TRANSDUCER FOR DETECTING SOUND VIBRATIONS.
AD-616 100 FLD. 9

SEMICONDUCTORS
USE OF SEMICONDUCTOR STRAIN GAGES.
AD-615 802 FLD. 14

•STRATOSPHERE
ARCTIC REGIONS
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
AD-616 320 FLD. 4

ENERGY
STRATOSPHERIC ENRGY PROCESSES AND ASSOCIATED ATMOSPHERIC LONG-WAVE STRUCTURE IN WINTER.
AD-616 129 FLD. 4

METEOROLOGY
ASPECTS OF THE MIDDLE STRATOSPHERE.
AD-616 253 FLD. 4

•STRESSES
MECHANICAL WAVES
ANALYSIS OF FREE-FIELD DATA IN A HALF-SPACE UNDER DYNAMIC LOADS.
AD-615 904 FLD. 20

PARAMAGNETIC MATERIALS

AD-616 092 FLD. 20

UNDERGROUND STRUCTURES
REPRINT: STRESSES AT TUNNEL INTERSECTIONS.
AD-616 018 FLD. 20

•STRESS(PSYCHOLOGY)
LEADERSHIP
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS.
AD-616 327 FLD. 5

•STRONTIUM COMPOUNDS
ZIRCONATES
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•STRUCTURAL GEOLOGY
BEACHES
REPRINT: BEACH PROCESS STUDIES.
AD-616 191 FLD. 8

GREAT BRITAIN
CRUSTAL STRUCTURE OF GREAT BRITAIN.
AD-616 093 FLD. 8

NORTH AMERICA
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES.
AD-616 298 FLD. 8

SPAIN
REPRINT: CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION.
AD-616 016 FLD. 8

UNITED STATES
REPRINT: CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE VELOCITY INVERSION.
AD-615 839 FLD. 8

•STRUCTURAL SHELLS
FLUTTER
FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
AD-616 321 FLD. 1

IMPACT SHOCK
TRANSLATION OF RUSSIAN RESEARCH. BEHAVIOR OF SHELLS AND PLATES UPON IMPACT.
AD-615 871 FLD. 20

STABILITY
TRANSLATION OF RUSSIAN RESEARCH: STABILITY OF AN ANISOTROPIC CIRCULAR CYLINDRICAL SHELL DURING LONGITUDINAL COMPRESSION, INTERNAL PRESSURE AND IRREGULAR HEATING IN LENGTH.
AD-615 872 FLD. 20

STRUCTURAL PROPERTIES
SANDWICH SHELL THEORY.
AD-615 949 FLD. 13

•STRUCTURES
DEFORMATION
PLASTIC DEFORMATION OF BEAMS UNDER EXPLOSIVE STRESS.

AD=616 220 FLD. 19

•STUDENTS
GROUP DYNAMICS
SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE.
AD=615 762 FLD. 5

•STYRENE PLASTICS
PYROLYSIS
REPRINT: LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD=615 852 FLD. 11

•SUBJECT INDEXING
ANALYSIS
INDEXING AIDS, PROCEDURES AND DEVICES.
AD=616 342 FLD. 5

•SUBMARINES
GUIDED MISSILES(UNDERWATER-TO-SURFACE
DEVELOPMENT OF USAGE RATE FOR SPARE PARTS OF FLEET BALLISTIC MISSILES.
AD=615 913 FLD. 15

•SUPERAERODYNAMICS
THEORY
THEORIES OF THERMAL TRANSPI RATION AND MOLECULAR EFFUSION.
AD=616 285 FLD. 1

•SUPERCONDUCTIVITY
ALUMINUM
REPRINT: STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM.
AD=616 203 FLD. 20

CIRCUITS
SUPERCONDUCTIVE TANK CIRCUITS AS NETWORK ELEMENTS.
AD=615 964 FLD. 9

TITANIUM ALLOYS
REPRINT: SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM.
AD=616 054 FLD. 11

•SUPERCONDUCTORS
ABSORPTION SPECTRUM
REPRINT: UMKLAPP CONTRIBUTION TO BULK ABSORPTION IN SUPERCON DUCTORS.
AD=616 044 FLD. 20

MAGNETIC FIELDS
REPRINT: CRITICAL MAGNETIC FIELD OF A THIN FILM OF SUPERC ONDUCTOR.
AD=615 850 FLD. 20

THERMAL CONDUCTIVITY
REPRINT: THEORY OF THE THERMAL CONDUCTIVITY OF SUPERCON DUCTING ALLOYS WITH PARAMAGNETIC IMPURITIES.
AD=615 849 FLD. 20

TUNGSTATES
REPRINT: SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES.
AD=616 055 FLD. 20

VISCOSITY
REPRINT: VISCOSITY OF SUPER CONDUCTORS.
AD=616 090 FLD. 20

•SUPERSONIC FLOW
SEPARATION
FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART.
AD=616 236 FLD. 1

•SURFACE PROPERTIES
ADSORPTION
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE.
AD=616 116 FLD. 7

MASERS
REPRINT: SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
AD=616 190 FLD. 20

•SURGERY
CHILDREN
REPRINT: FEMORAL HERNIA IN CHILDREN.
AD=616 195 FLD. 6

HEMORRHAGE
REPRINT: RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS.
AD=616 177 FLD. 6

•SURGICAL TECHNIQUES
MECHANICAL ORGANS
REPRINT: EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION.
AD=616 134 FLD. 6

•SWITCHING CIRCUITS
COMPUTER LOGIC
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC.
AD=616 325 FLD. 9

•SYMMETRY(CRYSTALLOGRAPHY)
CLASSIFICATION
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
AD=616 246 FLD. 20

•SYNTHESIS
CONTROL SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF AUTOMATIC CONTROL SYSTEMS BY THE METHOD OF SUCCESSIVE APPROXIMATIONS.
AD=615 869 FLD. 14

•SYSTEMS ENGINEERING
LOGISTICS
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING.
AD=616 378 FLD. 15

•S-MATRIX
DECAY SCHEMES
REPRINT: LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY.
AD=616 048 FLD. 18

•TABLES
BLACKBODY RADIATION
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES.
AD=616 271 FLD. 20

STATISTICAL DISTRIBUTIONS
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(R|N,P) FOR LARGE N AND SMALL P.
AD=616 370 FLD. 12

•TANTALUM CAPACITORS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR THE IMPROVED RELIA BILITY OF SOLID TANTALUM CAPAC ITORS.
AD=615 958 FLD. 9

AD=616 299 FLD. 9

•TANTALUM COMPOUNDS
SPUTTERING
AD=615 808 FLD. 9

•TEACHING MACHINES
EDUCATION
ESSENTIAL PRINCIPLES OF PROGRAMED INSTRUCTION.
AD=616 296 FLD. 5

•TELEVISION DISPLAY SYSTEMS
PSEUDORANDOM SYSTEMS
PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
AD=616 275 FLD. 17

•TELEVISION GUIDANCE
POSITIONING REACTIONS
EFFECT OF AUGMENTED TELEVISION DEPTH CUES ON THE TERMINAL PHASE OF REMOTE DRIVING.
AD=615 929 FLD. 6

•TERMINAL BALLISTICS
PERMAFROST
PENETRATION OF PROJECTILES INTO FROZEN GROUND.
AD=616 348 FLD. 19

•TERRAIN
CIVIL ENGINEERING
QUANTITATIVE TERRAIN FACTORS AS RELATED TO SOIL PARENT MATERIALS AND THEIR ENGINEERING CLASSIFICATION.
AD=616 363 FLD. 8

•TERRESTRIAL MAGNETISM
GRANITE
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA.
AD=616 397 FLD. 8

MATHEMATICAL ANALYSIS
CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD.
AD=616 259 FLD. 8

POLAR REGIONS
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES.
AD=616 389 FLD. 4

SOLAR WIND
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE.
AD=615 780 FLD. 20

SURVEYING
THE SURVEY OF THE GEOMAGNETIC FIELD IN SPACE.
AD=616 421 FLD. 8

UPPER ATMOSPHERE
THE UPPER ATMOSPHERE AND GEOMAGNETISM.
AD=616 409 FLD. 4

•TEST EQUIPMENT
ABSTRACTING
TRANSDUCER INFORMATION CENTER: QUARTERLY ACCESSION LIST 8.
AD=616 328 FLD. 14

QUALITY CONTROL
TRANSLATION OF RUSSIAN PATENT: AUTOMATIC GAMMA FLAW DETECTOR.
AD=615 992 FLD. 14

SNOW
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW.
AD=615 997 FLD. 14

•TEST FACILITIES
GUIDED MISSILES
USER'S GUIDE TO THE EXPERIMENTAL SURFACE-LAUNCHED WEAPON-CONTROL TEST FACILITY.

AD-615 792 FLD. 14

NUCLEAR EXPLOSIONS
GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS OF THE SAND SPRINGS RANGE, FAIRVIEW VALLEY, AND FOURMILE FLAT, CHURCHILL COUNTY, NEVADA.
AD-615 793 FLD. 14

•TEST METHODS
HARDNESS
DETECTION AND EVALUATION OF SURFACE DECARBURIZATION OF STEEL COMPONENTS BY MEANS OF ROCKWELL HARDNESS TEST PROCEDURES.
AD-615 823 FLD. 11

REFLECTION
EXPERIMENTS IN THE IDENTIFICATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
AD-615 951 FLD. 14

•TETRYL
MIXTURES
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES.
AD-615 895 FLD. 19

•TEXAS
CULICIDAE
REPRINT: OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS.
AD-615 836 FLD. 6

•THERMAL CONDUCTIVITY
NUMERICAL METHODS AND PROCEDURES
NUMERICAL SOLUTION FOR HEAT CONDUCTION IN A SOLID WITH A RECEDING SURFACE.
AD-616 156 FLD. 22

•THERMAL NEUTRONS
SCATTERING
SCATTERING OF X RAYS AND SLOW NEUTRONS FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 189 FLD. 20

•THERMAL PROPERTIES
SURFACES
THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPERATURES.
AD-616 238 FLD. 20

•THERMAL RADIATION
COCKPITS
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•THERMODYNAMICS
GAS FLOW
THEORIES OF THERMAL TRANSPIRATION AND MOLECULAR EFFUSION.
AD-616 285 FLD. 1

MATERIALS
REPRINT: THERMODYNAMICS OF MATERIALS WITH MEMORY.
AD-616 039 FLD. 20

PLATINUM
REPRINT: ANALYSIS OF THERMODYNAMIC DATA FOR PLATINUM AND PREDICTION OF THETA (D0) (T), THE DEBYE CHARACTERISTIC TEMPERATURE OF THE DEBYE-WELLER FACTOR.
AD-616 213 FLD. 20

•THERMOELECTRICITY
TRANSDUCERS
THERMAL PORTS IN LINEAR NETWORK THEORY.
AD-616 387 FLD. 20

•THERMOPLASTICS
PYROLYSIS
REPRINT: LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 852 FLD. 11

•THRUST
ROCKET MOTORS
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER.
AD-615 862 FLD. 17

•THRUST BEARINGS
GAS BEARINGS
DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13
GAS BEARING DESIGN CHARTS. VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING.
AD-615 919 FLD. 13
GAS BEARING DESIGN CHARTS. VOLUME 2. THE HYDROSTATIC GAS JOURNAL BEARING AND THE HYDROSTATIC GAS THRUST BEARING.
AD-615 920 FLD. 13

HYDROSTATICS
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
AD-616 284 FLD. 13

•THULIUM
ELECTROMAGNETIC PROPERTIES
REPRINT: INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(3) ION IN LUTETIUM IRON GARNET.
AD-616 224 FLD. 20

•THUNDERSTORMS
RADAR ECHO AREAS
TWO STUDIES OF CONVECTION. A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION. HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS.
AD-616 094 FLD. 4

•TIN ALLOYS
X-RAY DIFFRACTION ANALYSIS
LOCAL ORDER IN LIQUID ALLOYS.
AD-616 277 FLD. 11

•TITANIUM ALLOYS
FRACTURE(MECHANICS)

AD-615 786 FLD. 11

SUPERCONDUCTIVITY
REPRINT: SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM.
AD-616 094 FLD. 11

•TNT
MIXTURES
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES.
AD-615 895 FLD. 19

UNDERWATER EXPLOSIONS
REPRINT: ENERGY PER UNIT-AREA SPECTRUM OF THE SHOCK WAVE FROM 1-LB TNT CHARGES EXPLODED UNDERWATER.
AD-616 154 FLD. 19

•TOPOLOGY
MAPS
THE COLOR PROBLEM.
AD-616 382 FLD. 8

•TORSION BARS
POTENTIAL THEORY
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY.
AD-616 095 FLD. 20

•TOWED BODIES
HYDRODYNAMICS
DTMB MARK I MEASUREMENT SYSTEM FOR CABLE-TOWED BODIES; TRANSDUCER DEVELOPMENT.
AD-615 767 FLD. 9

•TOWERS
TELEVISION ANTENNAS
TOWER FOR MULTIPLATE ANTENNA.
AD-615 784 FLD. 13

•TRAINING DEVICES
ANTISUBMARINE WARFARE
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-615 907 FLD. 5

•TRANSCENDENTAL FUNCTIONS
RATIONAL NUMBERS
THE RATIONAL POINTS ON A TRANSCENDENTAL CURVE.
AD-616 901 FLD. 12

•TRANSDUCERS
ACOUSTICS
GRAPHITE MONOPARTICULATE LAYER TRANSDUCER FOR DETECTING SOUND VIBRATIONS.
AD-616 100 FLD. 9

THERMOELECTRICITY
THERMAL PORTS IN LINEAR NETWORK THEORY.
AD-616 387 FLD. 20

UNDERWATER EQUIPMENT
DTMB MARK I MEASUREMENT SYSTEM FOR CABLE-TOWED BODIES; TRANSDUCER DEVELOPMENT.
AD-615 767 FLD. 9

•TRANSIENTS
SPACE CHARGES
REPRINT: TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS.
AD-616 176 FLD. 9

•TRANSISTOR AMPLIFIERS
L BAND
LOW-NOISE L-BAND AMPLIFIER.
AD-616 231 FLD. 9

•TRANSISTORS
GAIN
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-616 000 FLD. 9

MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE. TRANSISTOR, VHF, SILICON, POWER (25W-100MC).
AD-615 898 FLD. 9

•TRANSITION TEMPERATURE
HELIUM
REPRINT: BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS.
AD-616 022 FLD. 20

MANGANESE COMPOUNDS
REPRINT: ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE.
AD-616 092 FLD. 20

•TRANSMISSION LINES
ANTENNA FEEDS
INTEGRATED RADIATORS STUDY

AND INVESTIGATION.
AD-616 356 FLD. 9

DESIGN
DESIGN CONSIDERATIONS FOR TRANSMISSION LINES AND PULSE FORMING NETWORKS.
AD-615 824 FLD. 9

•TRANSMITTER-RECEIVERS
RADIO COMMUNICATION SYSTEMS
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
AD-615 953 FLD. 17

•TRANSPLANTATION
IMMUNITY
REPRINT: TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS.
AD-616 085 FLD. 6

•TRANSPORT PROPERTIES
GASES
AERONOMIC COLLISIONS.
AD-615 970 FLD. 4

PROGRAMMING(COMPUTERS)
REPRINT: AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL.
AD-616 225 FLD. 20

•TROPANE ALKALOIDS
MOLECULAR STRUCTURE
TRANSLATION OF FRENCH RESEARCH: STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES.
AD-616 337 FLD. 7

•TROPOSPHERE
PROPAGATION
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES.
AD-615 936 FLD. 20

•TRYPSIN
BIOCHEMISTRY
REPRINT: POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN.
AD-616 081 FLD. 6

•TUNGSTATES
SUPERCONDUCTIVITY
REPRINT: SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES.
AD-616 055 FLD. 20

•TUNGSTEN
SINTERING
USE OF REACTIVE ATMOSPHERES FOR THE TREATMENT OF B.C.C. METALS.
AD-616 273 FLD. 13

•TUNGSTEN COMPOUNDS
OXIDES
REPRINT: SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE.
AD-616 209 FLD. 20

•TUNNEL DIODES
MICROWAVE AMPLIFIERS
REPRINT: MICROWAVE TUNNEL DIODE AMPLIFIER.
AD-616 171 FLD. 9

•TURBOJET ENGINES
PERFORMANCE(ENGINEERING)
PROCESSING OF ENGINE DATA FOR DEVELOPMENT OF TURBOJET ENGINE ANALYZER. PROCESSING OF J79-13 DATA FROM A 500 HOUR CELL TEST.
AD-616 300 FLD. 21

•TURBOPUMPS
BEARINGS
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
AD-616 284 FLD. 13

•TURBULENCE
MANEUVERABILITY
TRANSLATION OF RUSSIAN ARTICLE ON MANEUVERABILITY IN AIR TURBULENCE.
AD-615 993 FLD. 1

•ULTRACENTRIFUGES
POLYMERS
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
AD-615 966 FLD. 7

•ULTRASONIC RADIATION
ALUMINUM
REPRINT: STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM.
AD-616 203 FLD. 20

•ULTRAVIOLET RADIATION
NYLON
TRANSLATION OF RUSSIAN RESEARCH: THE EFFECT OF ULTRAVIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS.
AD-616 283 FLD. 11

•ULTRAVIOLET SPECTROSCOPY
INSTRUMENTATION
REPRINT: APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET.
AD-616 230 FLD. 20

•UNCONVENTIONAL WARFARE
VENEZUELA
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY.
AD-615 910 FLD. 5

•UNDERGROUND ANTENNAS
RADIO TRANSMISSION
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN.
AD-615 794 FLD. 20

•UNDERGROUND STRUCTURES
STRESSES
REPRINT: STRESSES AT TUNNEL INTERSECTIONS.
AD-616 018 FLD. 20

•UNDERWATER EQUIPMENT
MATERIALS
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
AD-615 769 FLD. 14

•UNDERWATER PHOTOGRAPHY
OCEANOGRAPHIC VESSELS
NARRATIVE CHAIN CRUISE NO. 38, 5-16 AUGUST 1963.
AD-615 878 FLD. 8

•UNDERWATER SOUND
PROPAGATION
COMPUTER STUDY OF UNDERWATER SOUND RAYS AND REFRACTION EFFECTS.
AD-615 777 FLD. 20

SONAR EQUIPMENT
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
AD-615 877 FLD. 8

SOUND TRANSMISSION
SOUND REFLECTION AND SCATTERING BY THE OCEAN BOUNDARIES.
AD-615 918 FLD. 17

•UNITED STATES GOVERNMENT
MANAGEMENT PLANNING
FEDERAL BUDGET AS AN INDICATOR OF GOVERNMENT INTENTIONS AND THE IMPLICATIONS OF INTENTIONS.
AD-616 367 FLD. 15

•UNIVERSITIES
THEORY
FAILURE OF THE UNIVERSITIES. I: SCIENTIFIC AND TECHNOLOGICAL.
AD-616 368 FLD. 5

•UPPER ATMOSPHERE
DENSITY
ATMOSPHERIC DENSITY DETERMINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
AD-615 924 FLD. 4

PHYSICAL PROPERTIES
UPPER ATMOSPHERE AS OBSERVED WITH ROCKETS AND SATELLITES.
AD-616 374 FLD. 4

PHYSICS
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM.
AD-616 318 FLD. 4

TERRESTRIAL MAGNETISM
THE UPPER ATMOSPHERE AND GEOMAGNETISM.
AD-616 409 FLD. 4

•URINE
PURIFICATION
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
AD-615 979 FLD. 6

•USSR
ASTRONAUTS
TRANSLATION OF AUTOBIOGRAPHY OF VALENTINA NIKOLAYEVATERESHKOVA, FIRST FEMALE COSMONAUT OF THE USSR.
AD-615 863 FLD. 22

ATTITUDES
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW.
AD-616 417 FLD. 5

ECONOMICS
COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC.
AD-615 887 FLD. 5
SOVIET NATIONAL INCOME AND PRODUCT, 1958-1962: PART I. NATIONAL INCOME AT ESTABLISHED PRICES.
AD-616 306 FLD. 5

INDUSTRIAL PRODUCTION
SOVIET AND COMMUNIST CHINESE INDUSTRIALIZATION STRATEGIES.
AD-615 942 FLD. 5

•VACCINES
ANTIGEN-ANTIBODY REACTIONS
REPRINT: REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964.
AD-616 019 FLD. 6

•VAN ALLEN RADIATION BELT
ENERGY
MAXIMUM TOTAL ENERGY OF THE VAN ALLEN RADIATION BELT.
AD-616 418 FLD. 8

•VANADIUM COMPOUNDS
MAGNETIC PROPERTIES
REPRINT: MAGNETIC PROPERTIES OF V3 IONS IN CUBIC SPINELS.
AD-616 041 FLD. 8

•VENEZUELA
SOCIAL SCIENCES
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY.
AD-619 910 FLD. 5

•VERBAL BEHAVIOR
SOCIOMETRICS
RELATION BETWEEN TALING AND SOCIOMETRIC CHOICES.
AD-616 293 FLD. 5

•VIBRATION
HEARING
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
AD-619 916 FLD. 6

STABILITY
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-619 810 FLD. 20

•VIBRATORS(ELECTRICAL)
MEDICAL RESEARCH
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
AD-619 916 FLD. 6

•VIEWING SCREENS
ELECTROLUMINESCENCE
TRANSLATION OF RUSSIAN RESEARCH: ELEMENTS OF AN ELECTROLUMINESCENT SCREEN.
AD-616 268 FLD. 17

•VISCOELASTICITY
FLUIDS
REPRINT: CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH APPLICATION TO RAPID EXTERNAL FLOWS.
AD-616 083 FLD. 20

MECHANICAL WAVES
SPHERICAL WAVES IN VISCOELASTIC MEDIA.
AD-619 999 FLD. 20

•VORTICES
CONICAL BODIES
REPRINT: THE VORTICAL LAYER ON AN INCLINED CONE.
AD-616 209 FLD. 1

CYLINDRICAL BODIES
REPRINT: VISCOUS FLOW BETWEEN ROTATING CONCENTRIC CYLINDERS WITH A CIRCUMFERENTIAL PRESSURE GRADIENT AT SPEEDS ABOVE CRITICAL.
AD-616 084 FLD. 20

IONOSPHERIC DISTURBANCES
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES.
AD-616 360 FLD. 4

THEORY
ON THE BIRTH AND DECAY OF VORTICES.
AD-619 770 FLD. 20

•WAKE
SIMULATION
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-619 907 FLD. 5

•WATER
FILMS
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE.
AD-616 319 FLD. 20

•WATER VAPOR
BAND SPECTRUM
REPRINT: SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H20.
AD-616 089 FLD. 20

•WATER WAVES
MEASUREMENT
REFRACTIVE TECHNIQUE FOR MEASUREMENT OF WATER WAVE SLOPE.
AD-616 303 FLD. 8

•WAVE TRANSMISSION
ROCK(GEOLOGY)
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA.
AD-619 785 FLD. 20

•WAVEFORM GENERATORS
DESIGN
DESIGN AND PERFORMANCE OF A TRIANGULAR-WAVE-FORM GENERATOR.
AD-616 129 FLD. 9

•WAVEGUIDES
DESIGN
REPRINT: HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER.
AD-616 132 FLD. 9

ELECTROMAGNETIC WAVES
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY.
AD-619 827 FLD. 9

•WEAPON SYSTEMS
INVENTORY CONTROL
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT.
AD-619 948 FLD. 15

MANAGEMENT PLANNING
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING.
AD-616 378 FLD. 15

•WEAPONS
ELECTROMAGNETIC SHIELDING
PROPOSED FILTERED SHIELDED CONNECTOR FOR PROTECTION OF WEAPONS FROM ELECTROMAGNETIC RADIATION.
AD-616 304 FLD. 19

•WEATHER FORECASTING
STOCHASTIC PROCESSES
EXTENSIONS TO THEORY OF TIME-SERIES ANALYSIS.
AD-616 324 FLD. 12

•WELDING
STEEL
TRANSLATION OF RUSSIAN RESEARCH: SELECTION OF FLUX FOR WELDING HIGH-STRENGTH STEEL.
AD-616 281 FLD. 13

•WELDS
ALUMINUM ALLOYS
FRACTURE TOUGHNESS OF X7006-T6391 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
AD-619 781 FLD. 11

FATIGUE(MECHANICS)
REPRINT: EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 024 FLD. 13

NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN RESEARCH: WAYS FOR THE AUTOMATION OF NONDESTRUCTIVE WELD-JOINT INSPECTION METHODS.
AD-619 999 FLD. 13

•WINGS
AERODYNAMIC CONFIGURATIONS
MARVEL PROJECT: A UNIQUE SOLUTION TO THE PROBLEM OF OBTAINING TWO-DIMENSIONAL BOUNDARY LAYER DATA ON THE VARIABLE-CAMBER HIGH-LIFT WINGS OF THE MARVELETTE AIRCRAFT.
AD-619 928 FLD. 1

•X RAYS
SCATTERING
SCATTERING OF X RAYS AND SLOW NEUTRONS FROM FLUIDS OF NONSPHERICAL MOLECULES.
AD-616 189 FLD. 20

•XENON
CRYSTAL LATTICES
REPRINT: A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XENON.
AD-616 212 FLD. 20

•X-RAY DIFFRACTION ANALYSIS
CRYSTAL LATTICE DEFECTS

AD-619 917 FLD. 11
REPRINT: A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION.
AD-616 061 FLD. 20

•X-RAY PHOTOGRAPHY
STEEL
TRANSLATION OF RUSSIAN RESEARCH. ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION.
AD-619 876 FLD. 11

•X-RAY SPECTRUM
HYPERFINE STRUCTURE
REPRINT: EXPERIMENTAL OBSERVATION OF ELECTRIC-QUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA.
AD-616 023 FLD. 20

•YAGI ANTENNAS
WAVE TRANSMISSION
THE LONG YAGI-UDA ARRAY.
AD-619 803 FLD. 9

•ZINC
GRAIN BOUNDARIES
REPRINT: GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS.
AD-616 049 FLD. 11

•ZINC COMPOUNDS
OPTICAL PROPERTIES
NEW SOLID-STATE DEVICE CONCEPTS.
AD-616 390 FLD. 20

•ZIRCONATES
MECHANICAL PROPERTIES
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-619 809 FLD. 11

•ZIRCONIUM COMPOUNDS
IODIDES
REPRINT: MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES.
AD-616 211 FLD. 7

•ZONE MELTING
METALORGANIC COMPOUNDS
ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY BIPHENYL.
AD-619 968 FLD. 13

POTASSIUM COMPOUNDS
REPRINT: X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR.
AD-616 026 FLD. 20

PERSONAL AUTHOR INDEX

The fields indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

•ABDULAEV, G. B.
• • •
INVESTIGATING THE EFFECT OF GAMMA-RAYS, X-RAYS AND NEUTRONS ON ELECTRIC PROPERTIES OF CDS-SE AND CDSE-SE RECTIFYING SYSTEMS.
AD-619 868 FLD. 9

•ABELE, M. K.
• • •
ARRANGEMENT FOR PHOTOGRAPHING ARTIFICIAL EARTH SATELLITES
AD-616 307 FLD. 22

•ABEYTA, C. N.
• • •
SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H2O.
AD-616 089 FLD. 20

•ACHARYA, R.
• • •
CONCERNING SPACE-TIME AND SYMMETRY GROUPS.
AD-616 206 FLD. 20

•ADROVA, N. A.
• • •
DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN.
AD-619 991 FLD. 7

•ADSIT, N. R.
• • •
GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS.
AD-616 049 FLD. 11

•AGHASSI, J. J.
• • •
COVARIANT MERGING OF SPIN AND UNITARY SPIN.
AD-616 207 FLD. 20

•AHERN, J. E.
• • •
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-619 782 FLD. 21

•AHRENKIEL, R. K.
• • •
ELECTRON HALL MOBILITY IN THE ALKALI HALIDES.
AD-616 210 FLD. 20

•AKHMETZYANOV, M. KH.
• • •
NEWS OF THE ACADEMY OF SCIENCES OF THE USSR. MECHANICS AND MACHINE BUILDING, NO. 1, 1964 (SELECTED ARTICLES)
AD-619 990 FLD. 20

•AKIM, E. L.
• • •
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX.
AD-619 896 FLD. 22

•ALBERT, ARTHUR
• • •
REAL TIME COMPUTATION OF CONSTRAINED LEAST SQUARES ESTIMATORS.
AD-616 390 FLD. 12

•ALDER, JOHN E.
• • •
DISTRIBUTIONS AND CHARACT ERISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
AD-616 295 FLD. 4

•ALEKSEEVA, O. V.
• • •
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE
AD-616 308 FLD. 11

•ALEXANDER, R. W., JR.
• • •
PHOTOIONIZATION OF KRYPTON AND ARGON IN THE 100-300 ANGSTROM RANGE.
AD-619 776 FLD. 18

•ALGERMISSEN, S. T.
• • •
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES.
AD-616 160 FLD. 8

•ALLEN, J. A. VAN
• • •
ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE
AD-616 234 FLD. 20

•ALTICK, P.
• • •
EXCITED-STATE WAVE FUNCTIONS.
AD-619 976 FLD. 20

•AMBARTSUMYAN, R. V.
• • •
DETECTION OF SIGNALS IN A STREAM OF PULSES.
AD-619 994 FLD. 17

•AMBEGAOKAR, VINAY
• • •
THEORY OF THE THERMAL CONDUCTIVITY OF SUPERCONDUCTING ALLOYS WITH PARAMAGNETIC IMPUR ITIES.
AD-619 849 FLD. 20

•AMMAR, R. G.
• • •
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>9
AD-616 056 FLD. 20

•AMOROS, J. L.
• • •
A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION (ESTUDIO TOPOGRAFICO DE LAS IMPERFECCIONES DE UN CRISTAL POR DIFRACCION DE RAYOS X1 METODO DEL HAZ PARALELO).
AD-616 061 FLD. 20

•ANAND, D. K.
• • •
THERMAL PORTS IN LINEAR NETWORK THEORY.
AD-616 387 FLD. 20

•ANASTOS, GEORGE
• • •
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6.
AD-616 003 FLD. 6

•ANDAL, B. K.
• • •
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-619 961 FLD. 9

•ANDERSON, A. D.
• • •
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM.
AD-616 318 FLD. 4

•ANDERSON, DON L.
• • •
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES
AD-616 298 FLD. 8

•ANDERSON, J. E.
• • •
PERFORMANCE CHARACTERISTICS OF A FULLY DEVELOPED CONSTRICTED TRANSPIRATION-COOLED ARC.
AD-619 903 FLD. 20

•ANDERSON, ORSON L.
• • •
THE RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
AD-616 166 FLD. 8
• • •
LATTICE DYNAMICS IN GEOPH YSICS.
AD-616 167 FLD. 8
• • •
CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE
AD-616 168 FLD. 8

•ANTHONY, ALASTAIR
• • •
CURVED JET FLOWS, VOLUME II.
AD-616 397 FLD. 1

•ARABIAN, JACK M.
• • •
ADVANCED INERTIAL GYRO TEST EQUIPMENT DESIGNS.
AD-616 004 FLD. 17

•ARCHIBALD, ERWIN R.
• • •
THE CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
AD-619 967 FLD. 6

•ARENZ, R. J.
• • •
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS.
AD-616 344 FLD. 11

•ARLIN, M. N.
• • •
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

•ARMSTRONG, B. H.
• • •
EXCITED-STATE WAVE FUNCTIONS.
AD-619 976 FLD. 20

•ARNOLD, EUGENE A.
• • •
STRUCTURAL, CHEMICAL.

PHYSICAL, AND FUNCTIONAL ALTER ATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
AD-616 024 FLD. 6

• • •

EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES
AD-616 226 FLD. 6

•ARROW, KENNETH J.

• • •

QUASI-CONCAVE PROGRAMMING
AD-616 911 FLD. 9

•ARTHUR, RANSOM J.

• • •

THE OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE,
AD-616 152 FLD. 5

•ASHCROFT, N. W.

• • •

LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS
AD-616 088 FLD. 20

•ASHLEY, E. J.

• • •

INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM,
AD-616 142 FLD. 20

•ASOYAN, L. M.

• • •

COMPUTER TECHNOLOGY, 1963, NO. 3 (SELECTED ARTICLES)
AD-616 269 FLD. 9

•AU, W. S.

• • •

I=0 PION-PION AMPLITUDE AND SIGMA DI-PION,
AD-616 216 FLD. 20

•AUKERMAN, L. W.

• • •

RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

•AUSTIN, CARL F.

• • •

CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH,
AD-616 019 FLD. 8

•AVEN, M.

• • •

NEW SOLID-STATE DEVICE CONCEPTS,
AD-616 390 FLD. 20

•AVERBACH, B. L.

• • •

LOCAL ORDER IN LIQUID ALLOYS,
AD-616 277 FLD. 11

•AYRES, D. R.

• • •

TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

•BABBITT, RICHARD W.

• • •

CONTROL AND REPRODUCIBILITY OF FERRITES PREPARED BY THE FLAME SPRAY-HOT PRESS TECHNIQUE
AD-615 807 FLD. 11

•BAD'YANOV, B. N.

• • •

SELECTION OF FLUX FOR WELDING HIGHSTRENGTH STEEL
AD-616 281 FLD. 13

•BAENZIGER, N. C.

• • •

THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 033 FLD. 20

•BAKANOWSKI, A. E.

• • •

MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

•BAKER, DORAN J.

• • •

CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 338 FLD. 7

•BAKER, HARVIN C., JR.

• • •

RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER.
AD-615 911 FLD. 15

•BAKER, W. A.

• • •

MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES,
AD-616 211 FLD. 7

•BAKSHI, PRADIP

• • •

RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•BALABAN, P.

• • •

PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
AD-616 275 FLD. 17

•BALAKLEITSEVA, L. F.

• • •

CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES)
AD-615 982 FLD. 11

•BANDEL, H. W.

• • •

ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES,
AD-616 157 FLD. 20

•BANKS, PETER

• • •

INTRODUCTION TO THE STUDY OF AERONOMIC COLLISIONS,
AD-615 970 FLD. 4

•BARBER, W. C.

• • •

EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS,
AD-616 012 FLD. 20

•BARCUS, LUTHER C.

• • •

EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-615 810 FLD. 20

•BARDEEN, J.

• • •

VISCOSITY OF TYPE-II SUPERCONDUCTORS,
AD-616 090 FLD. 20

•BARILA, TIMOTHY G.

• • •

THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION
AD-616 134 FLD. 6

•BARLOW, E. J.

• • •

IS DETERRENCE ENOUGH OR SHOULD WE BE PREPARED TO FIGHT A GENERAL WAR IN THE 1960'S,
AD-616 414 FLD. 5

•BARONE, S. R.

• • •

THEORETICAL RESEARCH ON LASER OSCILLATION.
AD-615 804 FLD. 20

•BARRETT, C. R.

• • •

EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER
AD-615 926 FLD. 11

•BARRY, A. L.

• • •

INTERMODULATION ANALYSIS OF A CRYSTAL MIXER,
AD-615 829 FLD. 9

• • •

A SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS,
AD-616 021 FLD. 14

•BARRY, KEVIN G.

• • •

PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN,
AD-616 137 FLD. 6

•BARTON, J. A.

• • •

A COMPUTER PROGRAM INCORP ORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIA TION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
AD-616 106 FLD. 9

•BARUT, A. O.

• • •

I=0 PION-PION AMPLITUDE AND SIGMA DI-PION,
AD-616 216 FLD. 20

•BASINSKI, J. E.

• • •

INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS,
AD-616 101 FLD. 11

•BASKYS, BRONIUS

• • •

LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE,
AD-616 069 FLD. 6

•BASRI, SAUL A.

• • •

SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

•BASS, DAVID E.

• • •

EFFECTS OF OVERHYDRATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT,
AD-616 165 FLD. 6

•BAZLEY, N. W.

• • •

METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS,
AD-616 345 FLD. 13

•BEAN, J. P.
• • •
A COMPUTER STUDY OF UNDERWATER SOUND RAYS AND REFRACTION EFFECTS,
AD-615 777 FLD. 20

•BEARCE, L. S.
• • •
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER.
AD-615 811 FLD. 9

•BECKER, ABRAHAM S.
• • •
SOVIET NATIONAL INCOME AND PRODUCT, 1958-1962: PART I. NATIONAL INCOME AT ESTABLISHED PRICES,
AD-616 206 FLD. 5

•BEDER, N. M.
• • •
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES)
AD-615 982 FLD. 11

•BEEBE, W. M.
• • •
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS.
AD-616 344 FLD. 11

•BELLMAN, RICHARD
• • •
DIRECTIONS OF MATHEMATICAL RESEARCH IN NONLINEAR CIRCUIT THEORY,
AD-616 366 FLD. 9
• • •
THE FAILURE OF THE UNIVERSITIES. I: SCIENTIFIC AND TECHNOLOGICAL,
AD-616 368 FLD. 5
• • •
DYNAMIC PROGRAMMING AND CLASSICAL ANALYSIS,
AD-616 381 FLD. 12
• • •
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE,
AD-616 403 FLD. 20
• • •
FUNCTIONAL EQUATIONS IN THE THEORY OF DYNAMIC PROGRAMMING. XI: LIMIT THEOREMS
AD-616 408 FLD. 12
• • •
ON THE SEPARATION OF EXPONENTIALS,
AD-616 410 FLD. 12
• • •
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20
• • •
ASYMPTOTIC BEHAVIOR OF SOLUTIONS OF LINEAR PARABOLIC EQUATIONS,
AD-616 427 FLD. 12

•BELMONT, A. D.
• • •
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
AD-616 320 FLD. 4

•BENESCH, R.
• • •
MEASUREMENT OF THE FARADAY EFFECT IN A THETA-PINCH PLASMA USING A HE-NE LASER,
AD-616 019 FLD. 20

•BENNETT, JEAN M.
• • •
INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM,
AD-616 142 FLD. 20

•BENNETT, R. E.
• • •
CRYSTAL UNITS TYPE CR-(XM-11)/U, + TO 20 MC IN THE TYPE HC-27/U GLASS HOLDERS.
AD-616 388 FLD. 9

•BENSON, ROBERT W.
• • •
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
AD-615 916 FLD. 6

•BERG, HOWARD C.
• • •
AMPLITUDE AND DECAY RATE ANALYSIS OF LOW LEVEL EXPONENTIALLY DECAYING RADIOFREQUENCY SIGNALS
AD-616 149 FLD. 9
• • •
SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
AD-616 150 FLD. 20

•BERRIEN, F. KENNETH
• • •
JAPANESE VS. AMERICAN VALUES.
AD-616 196 FLD. 5

•BERRY, LESLIE A.
• • •
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT,
AD-615 938 FLD. 20

•BESSE, ARTHUR L.
• • •
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•BIBL, KLAUS
• • •
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

•BINGHAM, J. A.
• • •
A SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS,
AD-616 021 FLD. 14

•BIRKHOFF, GARRETT
• • •
DISCRETIZATION ERRORS FOR WELL-SET CAUCHY PROBLEMS.I.
AD-616 017 FLD. 12

•BJORKLAND, J. A.
• • •
EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 029 FLD. 20

•BLACKBURN, W. E.
• • •
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION.
AD-616 104 FLD. 1

•BLACKMER, ROY H. , JR.
• • •
DISTRIBUTIONS AND CHARACTERISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
AD-616 295 FLD. 4

•BLACKWELL, RODGER
• • •
RELIABLE LONG LIFE COMPONENT STUDY XLT METAL FILM RESISTOR.
AD-615 977 FLD. 9

•BODIN, ARTHUR M.
• • •
FAMILY INTERACTION, COALITION, DISAGREEMENT, AND COMPROMISE IN PROBLEM, NORMAL, AND SYNTHETIC FAMILY TRIADS.
AD-615 766 FLD. 5

•BOLGARSKII, A. V.
• • •
CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID-PROPELLANT ROCKET ENGINE,
AD-616 129 FLD. 21

•BOLLHAGEN, HEINS
• • •
RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON,
AD-616 199 FLD. 3

•BONESTEEL, R. M.
• • •
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES,
AD-615 927 FLD. 11

•BOSTICK, WINSTON H.
• • •
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
AD-615 780 FLD. 20
• • •
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES,
AD-616 360 FLD. 4

•BOTT, M. H. P.
• • •
CRUSTAL STRUCTURE OF GREAT BRITAIN,
AD-616 093 FLD. 8

•BOVILLE, BYRON W.
• • •
SOME ASPECTS OF THE MIDDLE STRATOSPHERE.
AD-616 253 FLD. 4

•BOWIN, C. O.
• • •
NARRATIVE OF CHAIN CRUISE NO. 43, 15 FEBRUARY21 AUGUST 1964.
AD-616 392 FLD. 8

•BOX, HAROLD C.
• • •
PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE
AD-616 062 FLD. 7
• • •
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACID IRRADIATED AT LOW TEMPERATURE
AD-616 063 FLD. 20

•BOYKIN, R. E.
• • •
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
AD-616 276 FLD. 8

•BRADFORD, JAMES C.
• • •
SEISMIC PARTIAL COHERENCY

STUDY.
AD-616 255 FLD. 17

•BRAMSON, A. S.
• • •
ATMOSPHERIC DENSITY DETER MINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
AD-615 924 FLD. 4

•BRAY, RALPH
• • •
OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX,
AD-616 184 FLD. 20

•BREILAND, JOHN G.
• • •
(1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS,
AD-616 008 FLD. 4

•BREKHOVSKIKH, L. M.
• • •
THE REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES,
AD-616 131 FLD. 20

•BRIGHAM, EUGENE F.
• • •
ECONOMIES OF SCALE IN THE SAVINGS AND LOAN INDUSTRY
AD-616 153 FLD. 5

•BRITTAIN, J. O.
• • •
GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS,
AD-616 045 FLD. 11

•BROADSTON, S.
• • •
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 055 FLD. 20

•BROGAN, J. J.
• • •
A SIMPLE NUMERICAL SOLUTION FOR HEAT CONDUCTION IN A SOLID WITH A RECEDING SURFACE,
AD-616 156 FLD. 22

•BRODIA, H. P.
• • •
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ,
AD-616 075 FLD. 14
• • •
A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERS TELLAR GRAINS,
AD-616 227 FLD. 3

•BROOKS, G. H.
• • •
BAKEABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE,
AD-616 145 FLD. 14

•BROOKS, MARVIN S.
• • •
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY-BIPHENYL.
AD-615 968 FLD. 13

•BROWN, FREDERICK C.
• • •
ELECTRON HALL MOBILITY IN THE ALKALI HALIDES,
AD-616 210 FLD. 20

•BROWN, J. S.
• • •
A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XEON,
AD-616 212 FLD. 20

•BROWN, JERRY
• • •
PEDO-ECOLOGICAL INVESTIGA TIONS, BARROW, ALASKA,
AD-615 998 FLD. 8

•BUNCE, E. T.
• • •
NARRATIVE OF CHAIN CRUISE NO. 42, 19 FEBRUARY21 AUGUST 1964.
AD-616 392 FLD. 8

•BUNTING, K. R.
• • •
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•BURGIEL, J. C.
• • •
ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE,
AD-616 092 FLD. 20

•BURGIS, DONALD R.
• • •
INDEXING AIDS, PROCEDURES AND DEVICES.
AD-616 342 FLD. 5

•BURICK, R. J.
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

•BURKE, EDWARD A.
• • •
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.02-3.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

•BURNSTEIN, EUGENE
• • •
INDIVIDUAL TASK PERFORMANCE IN A CHANGING SOCIAL STRUCTURE
AD-616 239 FLD. 5

•BUSHUEV, B. K.
• • •
MAGNETOMETER,
AD-615 981 FLD. 17

•BYFIELD, HUGH W.
• • •
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
AD-615 780 FLD. 20

•BYRNE, R. J.
• • •
THE ANGLE OF REPOSE OF A SINGLE GRAIN ON A FIXED ROUGH BED,
AD-615 787 FLD. 8

•CAIRNS, E. J.
• • •
SATURATED HYDROCARBON FUEL CELL PROGRAM.
AD-615 885 FLD. 10

•CALABI, L.
• • •
ON THE THEORY OF BOOLEAN FORMULAS: SUBFORMULAS AND SUBSTITUTION OPERATORS.
AD-616 122 FLD. 12

•CALLAWAY, JOSEPH
• • •
HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID,
AD-616 220 FLD. 20
• • •
ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM
AD-616 221 FLD. 20

•CAMBEL, ALI BULENT
• • •
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
AD-616 109 FLD. 1

•CANFIELD, CRAIG J.
• • •
THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
AD-616 073 FLD. 6

•CANNON, ROBERT H., JR.
• • •
VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
AD-616 188 FLD. 22

•CARLIN, ALAN
• • •
A POSSIBLE U.S. POLICY TOWARDS INDIAN TRANSPORTATION: AN ILLUSTRATION OF IMPROVED SECTORAL POLICIES,
AD-615 947 FLD. 13

•CARLSON, R. O.
• • •
NEW SOLID-STATE DEVICE CONCEPTS,
AD-616 350 FLD. 20

•CARLYLE, J. W.
• • •
REDUCED FORMS FOR STOCHASTIC SEQUENTIAL MACHINES,
AD-616 149 FLD. 9

•CARON, A. P.
• • •
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
AD-616 353 FLD. 20

•CARR, THOMAS D.
• • •
RADIO ASTRONOMICAL OBSERV ATIONS FROM A CANYON,
AD-616 198 FLD. 3

•CARROLL, R. E.
• • •
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT,
AD-615 893 FLD. 1

•CARTAINO, T. F.
• • •
VEHICLES FOR EXPLORATION ON MARS,
AD-616 407 FLD. 22

•CARY, SYLVIA G.
• • •
SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM,
AD-616 136 FLD. 6

•CASALE, PHILIP J.
• • •
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
AD-615 780 FLD. 20

•CASPARI, M. E.
• • •
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM IRON GARNET,
AD-616 229 FLD. 20

•CASTLEMAN, HARRIET
• • •
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•CATHOU, RENATA E.
• • •
RELAXATION SPECTRA OF RIBONUCLEASE,
AD-616 011 FLD. 7

•CAULFIELD, DAVID D.
• • •
IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER,
AD-616 087 FLD. 8

•CEDERLUND, THOMAS A.
• • •
GRAPHITE STRAIN TRANSDUCER,
AD-616 100 FLD. 9

•CHANG, R.
• • •
A FUNDAMENTAL STUDY OF DEFECT-DISLOCATION INTERACTION IN NACL TYPE LATTICES,
AD-615 979 FLD. 20

•CHARAP, J. M.
• • •
SU(6) AND CHARGE FORM FACTORS,
AD-616 091 FLD. 20

•CHASE, R. L.
• • •
NARRATIVE OF CHAIN CRUISE NO. 93, 15 FEBRUARY21 AUGUST 1964,
AD-616 392 FLD. 8

•CHAUNCEY, H. H.
• • •
REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE
AD-616 030 FLD. 6

•CHENG, H. S.
• • •
GAS BEARING DESIGN CHARTS, VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING,
AD-615 919 FLD. 13

•CHERNYI, N. N.
• • •
THE EFFECT OF ULTRAVIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS,
AD-616 283 FLD. 11

•CHERTKOV, YA. B.
• • •
NEW ADDITIVES TO FUELS AND LUBRICANTS,
AD-616 212 FLD. 21

•CHOMSKY, NOAM
• • •
ASPECTS OF THE THEORY OF SYNTAX,
AD-616 323 FLD. 5

•CHOW, C. Y.
• • •
GAS BEARING DESIGN CHARTS, VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING,
AD-615 919 FLD. 13

•CHOY, L.
• • •
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>5
AD-616 056 FLD. 20

•CHRISTIAN, GARY D.
• • •
POLAROGRAPHIC DETERMINATION OF TRACES OF GOLD IN BLOOD AND SERUM,
AD-616 138 FLD. 6

•CHUONG, S. H.
• • •
A VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962,
AD-615 851 FLD. 6

•CLAIBORNE, LEWIS T. , JR.
• • •
STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM,
AD-616 209 FLD. 20

•CLARK, E. N.
• • •
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
AD-616 330 FLD. 19

•CLAYTON, F. I.
• • •
FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART,
AD-616 236 FLD. 1

•COFFEY, DENIS M.
• • •
ON THE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN,
AD-616 121 FLD. 19

•COHEN, ARTHUR M.
• • •
A MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS,
AD-616 279 FLD. 9

•COHEN, M.
• • •
EXCITED-STATE WAVE FUNCTIONS,
AD-615 976 FLD. 20

•COHEN, WILLIAM
• • •
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•COLE, J. D.
• • •
ON ONE-DIMENSIONAL INVISCID MAGNETOHYDRODYNAMIC FLOW,
AD-616 398 FLD. 20

•COLEMAN, BERNARD D.
• • •
THERMODYNAMICS OF MATERIALS WITH MEMORY,
AD-616 039 FLD. 20

•COMBS, L. P.
• • •
STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART I. EXPERIMENTAL INVESTIGATION,
AD-615 798 FLD. 21

•COMMINS, WILLIAM D. , JR.
• • •
ON FBM SPARE PARTS USAGE RATE DEVELOPMENT,
AD-615 913 FLD. 15

•COMPTON, V. B.
• • •
ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUMGOLD (UBER DIE KRISTAL LSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-GOLD UND RUBIDIUM-GOLD),
AD-616 093 FLD. 20

•COMPTON, W. D.
• • •
X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR,
AD-616 026 FLD. 20

•CONRAD, MARCEL E.
• • •
THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
AD-616 073 FLD. 6

•COOK, KENNETH L.
• • •
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES,
AD-616 160 FLD. 8

•COOKE, KENNETH L.
• • •
ASYMPTOTIC BEHAVIOR OF SOLUTIONS OF LINEAR PARABOLIC EQUATIONS,
AD-616 427 FLD. 12

•COOPER, A. G.
• • •
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•COOPER, C. A.
• • •
TOWARD A GENERAL THEORY OF CUSTOMS UNION FOR DEVELOPING COUNTRIES,
AD-616 309 FLD. 9

•COOPER, IRWIN
• • •
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6

•COSTAIN, JOHN K.
• • •
AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES,
AD-616 160 FLD. 8

•COTA, G.
• • •
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM,
AD-615 908 FLD. 1

•COUGHLAN, GLENN B.
• • •
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 905 FLD. 17

•CRABBS, G. R.
• • •
PRODUCTION ENGINEERING MEASURE. TRANSISTOR, VHF, SILICON, POWER (25W-100MC).
AD-615 898 FLD. 9

•CRABBS, ROGER ALAN
• • •
THE CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES AIR FORCE.
AD-616 926 FLD. 5

•CRAMER, KENNETH R.
• • •
VARIABLE CONDUCTIVITY MFD COUETTE FLOW,
AD-616 354 FLD. 20

•CRAWFORD, T. M.
• • •
EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS,
AD-616 012 FLD. 20

•CRAYTON, N.
• • •
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>9
AD-616 056 FLD. 20

•CREANGE, JOHN E.
• • •
STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES,
AD-616 169 FLD. 6

•CROARKIN, JOHN A.
• • •
TRIANGULAR-WAVEFORM GENERATOR.
AD-616 125 FLD. 9

•CROWDER, BILLY LEE
• • •
SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE,
AD-616 209 FLD. 20

•CROXTON, F. E.
• • •
AUTOMATION PROGRESS AT RSIC: THE STATUS OF ALPHA 1,
AD-615 813 FLD. 5

•CUDKOWICZ, L.
• • •
EFFECT OF I-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THE VALSALVA MANEUVER,
AD-615 843 FLD. 6

•CUMMINGS, RALPH
• • •
SOME PROPERTIES OF STIFF MACROMOLECULES. I. MOLECULAR DIMENSIONS OF A WORM-LIKE CHAIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
AD-615 909 FLD. 11

•CUPPER, HELEN T.
• • •
THE OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE,
AD-616 152 FLD. 5

•CURTSINGER, B. E.
• • •
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-616 000 FLD. 9

•CUSTIS, I. H.
• • •
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS,
AD-615 881 FLD. 13

•CUTLER, P. H.
• • •
THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION
AD-616 202 FLD. 20

•DALMAN, G. C.
• • •
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

•DALTON, MARTIN L. , JR.
• • •
THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION
AD-616 134 FLD. 6

•DANKOV, G. YU.
• • •
CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION,
AD-615 899 FLD. 22

•DANTZIG, GEORGE B.
• • •
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6

•DANYUSHEVSKAYA, N. E.
• • •
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE
AD-616 308 FLD. 11

•DASHKOV, A. A.
• • •
OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT,
AD-615 858 FLD. 22

•DAVIS, D. H.
• • •
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>9
AD-616 056 FLD. 20

•DAVIS, HARRY J.
• • •
NOTES ON THE USE OF SEMIC ONDUCTOR STRAIN GAGES,
AD-615 802 FLD. 14

•DAVIS, HUBERT T.
• • •
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•DAVIS, P. B.
• • •
RADIATION EFFECTS IN GAAS.
AD-616 019 FLD. 18

•DAVIS, R. A.
• • •
ON THE FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES,
AD-616 923 FLD. 13

•DAWSON, G. A.
• • •
THE LIFETIME OF POSITIVE STREAMERS IN A PULSED POINT-TO-PLANE GAP IN ATMOSPHERIC AIR,
AD-616 077 FLD. 20
• • •
A MODEL FOR STREAMER PROPAGATION,
AD-616 078 FLD. 20

•DAWSON, L. R.
• • •
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
AD-616 393 FLD. 20

•DE PIAN, LOUIS
• • •
THERMAL PORTS IN LINEAR NETWORK THEORY,
AD-616 387 FLD. 20

•DEAVERS, S.
• • •
EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS,
AD-616 170 FLD. 6

•DEBAIX, A.
• • •
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 290 FLD. 3
• • •
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958.
AD-616 292 FLD. 3

•DEHAVEN, JAMES C.
• • •
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6

•DEITZ, V. R.
• • •
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE.
AD-616 116 FLD. 7

•DELAND, E. C.
• • •
CONTINUOUS PROGRAMMING METHODS ON AN ANALOG COMPUTER
AD-616 379 FLD. 9

•DEMETRIADES, ANTHONY
• • •
TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS
AD-616 176 FLD. 9

•DEPASQUALI, G.
• • •
SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129,
AD-616 037 FLD. 20

•DERECHO, A. T.
• • •
EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 034 FLD. 13

•DESSLER, A. J.
• • •

MAXIMUM TOTAL ENERGY OF THE VAN ALLEN RADIATION BELT.
AD-616 918 FLD. 8

•DEUTSCH, S.
• • •
PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
AD-616 278 FLD. 17

•DEWAARD, H.
• • •
SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129.
AD-616 037 FLD. 20

•DICKEY, FRED P.
• • •
NEAR-INFRARED EMISSION SPECTRUM OF NO.
AD-616 163 FLD. 20

•DICKINSON, STANLEY K. , JR.
• • •
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
AD-616 296 FLD. 20

•DIMARCO, JOSEPH N.
• • •
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE.
AD-615 780 FLD. 20

•DIPRIMA, R. C.
• • •
VISCOUS FLOW BETWEEN ROTATING CONCENTRIC CYLINDERS WITH A CIRCUMFERENTIAL PRESSURE GRADIENT AT SPEEDS ABOVE CRITICAL
AD-616 084 FLD. 20

•DOAN, D. J.
• • •
RESEARCH ON AMMONIA BATTERY SYSTEM.
AD-615 973 FLD. 10

•DOBRY, A. M.
• • •
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•DOHERTY, W. R.
• • •
A COMPUTER PROGRAM INCORP ORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIA TION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
AD-616 106 FLD. 9

•DOLUKHANOV, M. P.
• • •
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES)
AD-616 130 FLD. 20

•DOUGLASS, D. H. , JR.
• • •
BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS.
AD-616 022 FLD. 20

•DOUGLASS, H. E.
• • •
PROCESSING OF ENGINE DATA FOR DEVELOPMENT OF TURBOJET ENGINE ANALYZER. PART II. PROCESSING OF J79-19 DATA FROM A 900 HOUR CELL TEST.
AD-616 300 FLD. 21

•DOWELL, EARL H.
• • •
THE FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
AD-616 321 FLD. 1

•DOWLING, JOHN
• • •
TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE.
AD-615 838 FLD. 8

•DOYLE, J. R.
• • •
THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 039 FLD. 20

•DRELL, S. D.
• • •
BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS.
AD-616 183 FLD. 20

•DRESHER, MELVIN
• • •
SOME MILITARY APPLICATIONS OF THE THEORY OF GAMES.
AD-616 413 FLD. 18

•DREW, CHARLES M.
• • •
STUDY OF QUENCHED ALUMINUN PARTICLE COMBUSTION.
AD-616 143 FLD. 21

•DUBNOVA, A. M.
• • •
DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN.
AD-615 991 FLD. 7

•DUCKETT, STEVEN W.
• • •
LIFETIME OF THE EXCITED I(-) CENTER IN KCI.
AD-616 082 FLD. 20

•DUFFIN, R. J.
• • •
THE GYRATION OPERATOR IN NETWORK THEORY.
AD-616 329 FLD. 9

•DUPONT, JEAN-RENE
• • •
A KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE.
AD-616 139 FLD. 6

•DURELLI, A. J.
• • •
AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•DVORNIKOVA, I. V.
• • •
DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE.
AD-615 869 FLD. 20

•DWIGHT, K.
• • •
MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS
AD-616 041 FLD. 8

•DZHABADARI, A. V.
• • •
AUTOMATIC GAMMA FLAW DETECTOR.
AD-615 992 FLD. 14

•D'ANNESSA, A. T.
• • •
FRACTURE TOUGHNESS OF X7006-T6351 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
AD-615 781 FLD. 11

•EAGLESON, P. S.
• • •
EXPERIMENTAL STUDY OF LONGSHORE CURRENTS ON A PLANE BEACH.
AD-615 790 FLD. 8

•EASTMAN, L.
• • •
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

•ECKERT, E. R. G.
• • •
PERFORMANCE CHARACTERISTICS OF A FULLY DEVELOPED CONSTRICTED TRANSPIRATION-COOLED ARC.
AD-615 903 FLD. 20

•EDELEN, DOMINIC G. B.
• • •
DRAGGING ALONG AND INVARIANT DIFFERENTIATION.
AD-615 996 FLD. 12

•EDGERTON, ROBERT
• • •
POLARIZED EMISSION FROM KIITI AT 12K.
AD-616 031 FLD. 20

•EDWARDS, DAVID M.
• • •
HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID.
AD-616 220 FLD. 20

•EHLE, R. S.
• • •
NEW SOLID-STATE DEVICE CONCEPTS.
AD-616 390 FLD. 20

•EHRLICH, R. D.
• • •
EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 023 FLD. 20

•EINAUDI, F.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY.
AD-615 963 FLD. 9

•EINSTEIN, ELIZABETH ROBOZ
• • •
IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID.
AD-616 228 FLD. 6

•EKLUND, ARNOLD M.
• • •
NOISE SOURCE FOR MILLIMETER WAVELENGTH.
AD-616 279 FLD. 9

•ELBAUM, C.
• • •
GROWTH OF DISLOCATION-FREE GALLIUM CRYSTALS.
AD-616 298 FLD. 20

•ELLINGTON, D. C.
• • •
PLASTIC DEFORMATION OF

STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
AD-616 330 FLD. 19

•ELLIS, J. W. , JR.
• • •
THE CONTEXTUAL STUDY: A STRUCTURED APPROACH TO THE STUDY OF POLITICAL AND MILITARY ASPECTS OF LIMITED WAR.
AD-616 406 FLD. 5

•ELYASBERG, P. E.
• • •
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX,
AD-615 856 FLD. 22

•ENEEV, T. M.
• • •
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX,
AD-615 856 FLD. 22

•ENGBERG, L. W.
• • •
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
AD-616 320 FLD. 4

•ENGLE, I. A.
• • •
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
AD-616 330 FLD. 19

•ENGLISH, G. C.
• • •
INVESTIGATION OF THE MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
AD-615 789 FLD. 11

•ENOCHSON, L. D.
• • •
SEISMIC PARTIAL COHERENCY STUDY.
AD-616 255 FLD. 17

•ENTHOVEN, ALAIN C.
• • •
QUASI-CONCAVE PROGRAMMING
AD-616 411 FLD. 5

•ENZINGER, FRANZ M.
• • •
HEMANGIOSARCOMA OF THE BREAST,
AD-616 027 FLD. 6

•EPPLER, WALTER G. , JR.
• • •
VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
AD-616 185 FLD. 22

•ERLANGER, BERNARD F.
• • •
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•ESPOSITO, GEORGE G.
• • •
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS-LIQUID CHROMATOGRAPHY,
AD-615 955 FLD. 7

•EVENSON, K. M.
• • •
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ,
AD-616 079 FLD. 14

•FAHEY, R. E.
• • •
ELECTRIC FURNACE FOR OPERATION IN OXIDIZING, NEUTRAL, AND REDUCING ATMOSPHERES TO 2400 C,
AD-616 133 FLD. 14

•FAIRTHORNE, R. A.
• • •
BASIC PARAMETERS OF RETRIEVAL TESTS,
AD-616 175 FLD. 5

•FALCONER, I. S.
• • •
MEASUREMENT OF THE FARADAY EFFECT IN A THETA-PINCH PLASMA USING A HE-NE LASER,
AD-616 015 FLD. 20

•FAN, T. C.
• • •
A NOTE ON SANDWICH SHELL THEORY,
AD-615 945 FLD. 13

•FARELL, JULES
• • •
TEXTIR: A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM,
AD-615 763 FLD. 9

•FARRAR, J.
• • •
HIGH-ENERGY BATTERY SYSTEM STUDY,
AD-616 385 FLD. 10

•FEENBERG, EUGENE
• • •
MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS
AD-616 219 FLD. 20

•FEHER, ELSA ROSENVASSER
• • •
EFFECT OF UNIAXIAL STRESSES ON THE PARAMAGNETIC SPECTRA OF MN(3+) AND FE(3+) IN MGO
AD-616 052 FLD. 20

•FEHSENFELD, F. C.
• • •
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ,
AD-616 079 FLD. 14

•FEINGOLD, EARL
• • •
INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-615 817 FLD. 11

•FELDMAN, J. L.
• • •
CRITICAL ANALYSIS OF THE THERMODYNAMIC DATA FOR PT AND A PREDICTION OF THETA (DW) (T),
AD-616 213 FLD. 20

•FELSENFELD, OSCAR
• • •
BORRELIAE, HUMAN RELAPSING FEVER, AND PARASITE-VECTOR-HOST RELATIONSHIPS,
AD-616 135 FLD. 6

•FERGUSON, C. W.
• • •
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS,
AD-616 344 FLD. 11

•FERGUSON, E. E.
• • •
A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERSTELLAR GRAINS,
AD-616 227 FLD. 3

•FERRARO, ANTHONY J.
• • •
THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964,
AD-615 769 FLD. 20

•FERRISO, C. C.
• • •
SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H2O,
AD-616 089 FLD. 20

•FIEDLER, FRED E.
• • •
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS,
AD-616 327 FLD. 5

•FIELDS, A. E.
• • •
MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS,
AD-616 097 FLD. 11

•FINDIKYAN, NURHAN
• • •
THE SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE,
AD-615 762 FLD. 5

•FINE, M. E.
• • •
SOLID SOLUTION AND PRECIPITATION HARDENING IN MG-FE-O ALLOYS,
AD-616 046 FLD. 11

•FINKEL, V. M.
• • •
ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION,
AD-615 876 FLD. 11

•FINN, A. C.
• • •
BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS,
AD-616 183 FLD. 20

•FIRSTMAN, SIDNEY I.
• • •
BALLISTIC MISSILE PAYLOAD ALLOCATION,
AD-616 405 FLD. 16
• • •
OPTIMUM SEARCH ROUTINES FOR AUTOMATIC FAULT LOCATION
AD-616 415 FLD. 14
• • •
HOW MUCH AUTOMATICITY FOR CHECKOUT EQUIPMENT,
AD-616 425 FLD. 19

•FLYNN, C. P.
• • •
HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE,
AD-616 208 FLD. 14

•FOLKS, LEROY
• • •
RESEARCH ON AMMONIA BATTERY SYSTEM,
AD-615 973 FLD. 10

•FONER, S.
• • •
INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT,
AD-616 174 FLD. 20

•FONER, SIMON
• • •
ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINSKY-MORIYA COUPLING; ORIENTATION DEPENDENCE IN ALPHA-FE203
AD-616 173 FLD. 20

•FORRESTER, A. THEODORE
• • •
THE IONIZATION OF CESIUM IN TUNGSTEN CAPILLARIES,
AD-615 932 FLD. 7

•FORSTER, J. H.
• • •
MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

•FOSBURG, R. G.
• • •
FEMORAL HERNIA IN CHILDREN
AD-616 159 FLD. 6

•FOSTER, G.
• • •
GAMMA SCANNING OF SATAR SATELLITE WL-912.
AD-615 925 FLD. 22

•FOWLER, WILLIAM A.
• • •
PROPERTIES OF MASSIVE OBJECTS.
AD-616 191 FLD. 3

•FOX, D. W.
• • •
METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS,
AD-616 245 FLD. 13

•FOX, LLOYD E.
• • •
A METHOD OF SILVER PLATING GLASS BEADS.
AD-615 880 FLD. 13

•FOX, MARTIN
• • •
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, E,TIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
AD-616 299 FLD. 4

•FOXWORTHY, V. L.
• • •
ATMOSPHERIC DENSITY DETER MINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
AD-615 924 FLD. 4

•FRANCIS, W. E.
• • •
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM,
AD-616 318 FLD. 4

•FRANK, L. A.
• • •
A SURVEY OF ELECTRONS E > 40 KEV BEYOND 9 EARTH RADII WITH EXPLORER 14,
AD-616 172 FLD. 4

•FRANKOVSKY, FRANK A.
• • •
STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION ON ELECTRONIC PARTS AND MATERIALS (SCORRE).
AD-616 007 FLD. 9

•FRASER, D. C.
• • •
A CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD,
AD-616 259 FLD. 8

•FREIBERGER, WALTER
• • •
EXTENSIONS TO THEORY OF TIME-SERIES ANALYSIS.
AD-616 324 FLD. 12

•FREIER, P. S.
• • •
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963,
AD-616 297 FLD. 18

•FRESH, J. W.
• • •
A VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962,
AD-615 851 FLD. 6

•FREUND, HAROLD G.
• • •
PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE
AD-616 062 FLD. 7
• • •
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACID IRRADIATED AT LOW TEMPERATURE
AD-616 063 FLD. 20

•FRISCH, H. L.
• • •
ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS,
AD-616 161 FLD. 20

•FROSCH, R.
• • •
ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11,
AD-616 193 FLD. 20

•FRUNZE, T. M.
• • •
SYNTHESIS AND INVESTIGATION OF PROPERTIES OF CERTAIN HOMOG ENEOUS AND MIXED POLYBENZIMIDA ZOLES,
AD-615 869 FLD. 11

•FRUSILLO, MATTHEW M.
• • •
SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM,
AD-616 136 FLD. 6

•FUDENBERG, H. H.
• • •
LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY
AD-615 839 FLD. 6

•FULKERSON, D. R.
• • •
AN OUT-OF-KILTER METHOD FOR MINIMAL COST FLOW PROBLEMS.
AD-615 884 FLD. 5

•FULTON, FORREST F. , JR.
• • •
THE COMBINED RADIATION PATTERN OF THREE ORTHOGONAL DIPOLES,
AD-616 239 FLD. 9

•FUNK, J. E.
• • •
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•FUNKHOUSER, YVONNE TREADWELL
• • •
WIT AND HUMOR. AN ANNOTATED BIBLIOGRAPHY,
AD-616 127 FLD. 9

•GALLAGHER, ROBERT D.
• • •
A MICROWAVE TUNNEL DIODE AMPLIFIER,
AD-616 171 FLD. 9

•GALVIN, C. J. , JR.
• • •
EXPERIMENTAL STUDY OF LONGSHORE CURRENTS ON A PLANE BEACH,
AD-615 790 FLD. 8

•GARBER, T. B.
• • •
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS,
AD-616 922 FLD. 22

•GARINTHER, GEORGES R.
• • •
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER-RIFLES,
AD-615 934 FLD. 6

•GARRETT, DEAN A.
• • •
THE SENSORY RESPONSES OF THE HOUSE FLY, MUSCA DOMESTICA LINN., TO ATTRACTANTS,
AD-616 369 FLD. 6

•GAUL, R. D.
• • •
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
AD-616 276 FLD. 8

•GEHATIA, MATATIAHU
• • •
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
AD-615 966 FLD. 7

•GEISLER, MURRAY A.
• • •
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING
AD-616 378 FLD. 15
• • •
LOGISTICS RESEARCH AND MANAGEMENT SCIENCE,
AD-616 926 FLD. 15

•GEMINOV, V. N.
• • •
STRENGTH OF THIN METAL FIBERS.
AD-615 875 FLD. 20

•GENDZEL, IVAN G.
• • •
THE OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE,
AD-616 152 FLD. 5

•GENT, A. N.
• • •
MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS,
AD-616 097 FLD. 11

•GERBER, CHARLES F.

• • •
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES.
AD-616 286 FLD. 13

•GERHART, F. JAMES
• • •
A SIX-BORON CARBORANE (CH3)2C2B6H6 AND B6H10:P (C6H5)3 FROM HEXABORANE-10.
AD-615 959 FLD. 7

•GEVORKYAN, M. G.
• • •
COMPUTER TECHNOLOGY, 1963, NO. 3 (SELECTED ARTICLES)
AD-616 269 FLD. 9

•GIBSON, W. A.
• • •
REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE
AD-616 030 FLD. 6

•GILLIN, NORMAN R.
• • •
QUARTZ CRYSTAL UNIT CR-(XM-37)/U.
AD-616 256 FLD. 9

•GIVENS, E. ROUZEE
• • •
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
AD-616 128 FLD. 1

•GLASER, P. E.
• • •
CHARACTERISTICS OF METAL VAPORS.
AD-616 110 FLD. 20

•GLASS, WERNER
• • •
HYDROGEN-BROMINE FUEL CELL.
AD-616 108 FLD. 10

•GLASSGOLD, A. E.
• • •
SPIN-EXCHANGE SCATTERING IN UNIFORM MAGNETIC FIELDS
AD-615 978 FLD. 20

•GLICK, A. J.
• • •
VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
AD-616 057 FLD. 20

•GLUSS, BRIAN
• • •
OPTIMUM SEARCH ROUTINES FOR AUTOMATIC FAULT LOCATION
AD-616 915 FLD. 14

•GOLDBERGER, M. L.
• • •
LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY,
AD-616 048 FLD. 18

•GOLDEMBERG, J.
• • •
EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS,
AD-616 012 FLD. 20

•GOLDEN, D. E.
• • •
ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES.
AD-616 157 FLD. 20

•GOLDEN, KENNETH I.
• • •
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•GOLDMAN, RALPH F.
• • •
TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN
AD-616 169 FLD. 6

•GOLOMB, DAN
• • •
THE EVOLUTION OF AN IONOSPHERIC HOLE.
AD-615 969 FLD. 4

•GOOD, R. C. , JR.
• • •
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION,
AD-616 336 FLD. 10

•GOODENOUGH, J. B.
• • •
SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y),
AD-616 049 FLD. 20

•GOODFRIEND, P. L.
• • •
APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET.
AD-616 230 FLD. 20

•GOODMAN, JOHN M.
• • •
PREDICTION OF FARADAY ROTATION ANGLES AT VHF AND UHF.
AD-615 822 FLD. 20

•GOODMAN, LEO A.
• • •
PARAMETER-FREE AND NONPARAMETRIC TOLERANCE LIMITS: THE EXPONENTIAL CASE.
AD-616 369 FLD. 12

•GOODMAN, M. W.
• • •
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. I. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS.
AD-615 771 FLD. 13

•GOODWIN, J. W.
• • •
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY USS AUSTIN (LPD-4),
AD-616 237 FLD. 13

•GORDON, ALVIN S.
• • •
STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION,
AD-616 143 FLD. 21

•GORDON, ROBERT B.
• • •
ENERGY OF GRAIN BOUNDARIES IN HALITE.
AD-616 049 FLD. 11

•GOULD, D. J.
• • •
STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER,
AD-616 072 FLD. 6

•GRAFT, R. D.
• • •
RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

•GRAHAM, JAMES M.
• • •
CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY,
AD-616 029 FLD. 6

•GRAY, A. P.
• • •
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-M-CARBORANYLENESILOXANES.
AD-615 819 FLD. 7

•GRAY, M. L.
• • •
PRODUCTION MODEL ACCEPTANCE CRITERIA.
AD-615 919 FLD. 13

•GREEN, CAROLYN A.
• • •
DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS
AD-616 389 FLD. 11

•GREEN, EDWARD B.
• • •
TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN
AD-616 169 FLD. 6

•GREENE, T. E.
• • •
THE CONTEXTUAL STUDY: A STRUCTURED APPROACH TO THE STUDY OF POLITICAL AND MILITARY ASPECTS OF LIMITED WAR.
AD-616 906 FLD. 5

•GREENWOOD, N. N.
• • •
HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
AD-616 188 FLD. 7

•GRIFFIN, ALLAN
• • •
THEORY OF THE THERMAL CONDUCTIVITY OF SUPERCONDUCTING ALLOYS WITH PARAMAGNETIC IMPURITIES,
AD-615 849 FLD. 20

•GRINDLE, SHIRLEY L.
• • •
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS,
AD-616 296 FLD. 11

•GROSECLOSE, JOHN K.
• • •
TOWER FOR MULTIPLATE ANTENNA.
AD-615 789 FLD. 13

•GROSS, JOSEPH F.
• • •
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER
AD-615 949 FLD. 1

•GROSS, O.
• • •
SOME SPECIAL SEARCH PROBLEMS
AD-616 377 FLD. 12
• • •
THE RATIONAL POINTS ON A TRANSCENDENTAL CURVE,
AD-616 401 FLD. 12

•GROSSBARD, NEIL J.

• • •
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-2.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

•GROVES, G. W.
• • •
SOLID SOLUTION AND PRECIP ITATION HARDENING IN MG-FE-O ALLOYS,
AD-616 046 FLD. 11

•GROVES, GORDON W.
• • •
A DESCRIPTION OF THE FESTSA SYSTEM,
AD-616 009 FLD. 9

•GRUENBERGER, FRED
• • •
AN EXPERIMENT IN CHESS PLAYING BY MACHINE,
AD-616 376 FLD. 9

•GUNDERSON, E. K. ERIC
• • •
THE RELIABILITY OF PERSONALITY RATINGS UNDER VARIED ASSESSMENT CONDITIONS,
AD-616 148 FLD. 5

•GUNTON, R. C.
• • •
BAKEABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE,
AD-616 149 FLD. 14

•GUPTA, SHANTI S.
• • •
A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL,
AD-615 898 FLD. 12

•HAFEMEISTER, D. W.
• • •
SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129,
AD-616 037 FLD. 20

•HAFNER, ERIC
• • •
SUPERCONDUCTIVE TANK CIRCUITS AS NETWORK ELEMENTS
AD-615 964 FLD. 9

•HAHN, P. G.
• • •
A COMPUTER PROGRAM INCORP ORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIA TION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM,
AD-616 106 FLD. 9

•HAIMSON, J.
• • •
A HIGH CURRENT INVESTIGATION OF A 10 MEV SBAND ELECTRON LINEAR ACCELERATOR.
AD-615 919 FLD. 18

•HALD, A.
• • •
THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPEC TION BY ATTRIBUTES,
AD-615 797 FLD. 13

•HALE, D. M.
• • •
SOME EFFECTS OF ANOXIA ON TISSUE METABOLISM,
AD-616 181 FLD. 6

•HALE, JACK K.
• • •
LINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFI CIENTS,
AD-615 806 FLD. 12

•HALL, R. N.
• • •
NEW SOLID-STATE DEVICE CONCEPTS,
AD-616 390 FLD. 20

•HALL, THOMAS J.
• • •
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD,
AD-615 921 FLD. 5

•HAM, NORMAN D.
• • •
AN EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
AD-615 922 FLD. 1

•HAMMES, GORDON G.
• • •
RELAXATION SPECTRA OF RIBONUCLEASE,
AD-616 011 FLD. 7

•HAN, M. Y.
• • •
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
AD-616 206 FLD. 20

•HANCOCK, WILLARD R.
• • •
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY-BIPHENYL.
AD-615 968 FLD. 13

•HANNON, W. J.
• • •
AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SUR FACE MOTION DUE TO DILATATIONAL WAVES,
AD-615 842 FLD. 8

•HANSEL, JAMES G.
• • •
LINEAR PYROLYSIS OF THERM OPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 852 FLD. 11

•HANSON, FLOYD B.
• • •
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION,
AD-616 102 FLD. 1

•HARDING, LEONARD J.
• • •
A DIGITAL COMPUTER PROGRAM FOR CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS,
AD-615 902 FLD. 1

•HARKINS, CHARLES
• • •
SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM,
AD-616 136 FLD. 6

•HARMON, LOUIS E.
• • •
OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS,
AD-616 029 FLD. 6

•HARRELL, THOMAS W.
• • •
RELATION BETWEEN TALKING AND SOCIOMETRIC CHOICES,
AD-616 293 FLD. 5

•HARRIS, S.
• • •
KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES,
AD-616 032 FLD. 20

•HARTSOCK, ROBERT J.
• • •
NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOP OIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST
AD-616 026 FLD. 6

•HAWKINS, RALPH W.
• • •
DESIGN CONSIDERATIONS FOR TRANSMISSION LINES AND PULSE-FORMING NETWORKS,
AD-615 829 FLD. 9

•HAWTHORNE, G. B., JR.
• • •
DIGITAL SIMULATION AND MODELLING,
AD-615 831 FLD. 19

•HAYS, DAVID G.
• • •
AUTOMATIC LANGUAGE-DATA PROCESSING IN SOCIOLOGY,
AD-616 929 FLD. 5

•HAZONY, D.
• • •
THE GYRATION OPERATOR IN NETWORK THEORY,
AD-616 329 FLD. 9

•HEARLE, EDWARD F. R.
• • •
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT,
AD-615 998 FLD. 15

•HEARN, A. C.
• • •
BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS,
AD-616 183 FLD. 20

•HEDGPETH, JOEL W.
• • •
THE PACIFIC MARINE STATION SEA WATER SYSTEM.
AD-615 788 FLD. 19

•HELLMAN, W. S.
• • •
SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES,
AD-616 209 FLD. 20

•HELWIG, ELSON B.
• • •
OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS,
AD-616 029 FLD. 6
• • •
CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY,
AD-616 029 FLD. 6

•HENRY, C. D.
• • •
TWO STUDIES OF CONVECTION, A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION, HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS,
AD-616 099 FLD. 4

•HERMAN, ROBERT H.
• • •
THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
AD-616 073 FLD. 6

•HERMAN, YAYE F.
• • •
THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
AD-616 073 FLD. 6

•HERSEY, J. B.
• • •
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
AD-619 877 FLD. 8
• • •
NARRATIVE OF CHAIN CRUISE NO. 43, 19 FEBRUARY21 AUGUST 1964.
AD-616 292 FLD. 8

•HERSEY, JOHN B.
• • •
NARRATIVE CHAIN CRUISE NO. 38, 5-16 AUGUST 1962,
AD-619 878 FLD. 8

•HEYING, T. L.
• • •
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-M-CARBORANYLENESILOXANES,
AD-619 819 FLD. 7

•HIDA, KINZO
• • •
NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
AD-619 901 FLD. 1

•HILL, JACK H.
• • •
TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS
AD-616 176 FLD. 9

•HILL, L. S.
• • •
AN INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM
AD-616 241 FLD. 13

•HIRSCH, A. A.
• • •
MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES
AD-616 038 FLD. 20

•HIRSCH, WARREN M.
• • •
A STRONG LAW FOR THE MAXIMUM CUMULATIVE SUM OF INDEPENDENT RANDOM VARIABLES
AD-616 194 FLD. 12

•HO, P. Y.
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

•HOCHMAN, H.
• • •
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS. VII.
AD-619 775 FLD. 6

•HOEFFDING, OLEG
• • •
RECENT EFFORTS TOWARD COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC,
AD-619 887 FLD. 5

•HOEHN, F. W.
• • •
STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART I. EXPERIMENTAL INVESTIGATION,
AD-619 798 FLD. 21

•HOEKSTRA, D.
• • •
MULTI-LEVEL INVENTORY SYSTEMS: THE CASE OF THE SPARE AIRCRAFT ENGINES,
AD-619 892 FLD. 15

•HOEKSTRA, PIETER
• • •
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE
AD-616 315 FLD. 20

•HOFFMAN, GEORGE A.
• • •
ELECTRIC MOTOR CARS.
AD-619 883 FLD. 13

•HOFFMANN, LOUIS G.
• • •
THE STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS: APPLICATION TO THE ENUMERATION OF SAC'S
AD-616 201 FLD. 6

•HOLDEN, RICHARD M.
• • •
ACTA METEOROLOGICA SINICA, VOL. 34, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS
AD-619 956 FLD. 4
• • •
ACTA PHYSICA SINICA, VOL. 20, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS
AD-619 957 FLD. 20

•HOLLAND, H. W.
• • •
PRODUCTION ENGINEERING MEASURE FOR THE IMPROVED RELIABILITY OF SOLID TANTALUM CAPACITORS.
AD-619 958 FLD. 9

•HOLLISTER, M. P.
• • •
PROPELLANT CONTAINMENT UTILIZING SCREEN MESH AND PERFORATED PLATE SURFACES
AD-616 317 FLD. 21

•HOLONYAK, N. , JR.
• • •
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
AD-616 002 FLD. 20

•HONG, R.
• • •
LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY
AD-619 839 FLD. 6

•HOPP, D. S.
• • •
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(R|N,P) FOR LARGE N AND SMALL P,
AD-616 370 FLD. 12

•HORING, NORMAN J.
• • •
QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD,
AD-616 042 FLD. 20

•HORN, EUGENE F.
• • •
NEAR-INFRARED EMISSION SPECTRUM OF NO,
AD-616 163 FLD. 20

•HORN, LEON
• • •
NOTES ON THE USE OF SEMICONDUCTOR STRAIN GAGES,
AD-619 802 FLD. 14

•HOROWITZ, J.
• • •
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-619 907 FLD. 5

•HORTON, G. K.
• • •
CRITICAL ANALYSIS OF THE THERMODYNAMIC DATA FOR PT AND A PREDICTION OF THETA (D0) (T),
AD-616 213 FLD. 20

•HOSKINS, HARTLEY
• • •
IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER,
AD-616 087 FLD. 8

•HOUGH, DOROTHY A.
• • •
SPECTROPHOTOMETRIC MODIFICATION OF THE TAME ASSAY FOR PROTHROMBIN,
AD-616 180 FLD. 6

•HOULT, D. P.
• • •
WEAK SHOCK WAVES IN THE IONOSPHERE,
AD-616 067 FLD. 4

•HOUSE, E. L.
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,
AD-616 089 FLD. 6

•HOYLE, F.
• • •
PROPERTIES OF MASSIVE OBJECTS,
AD-616 191 FLD. 3

•HSU, Y. C.
• • •
FATIGUE FAILURE OF SURFACE FILMS.
AD-616 291 FLD. 20

•HU, T. C.
• • •
LAPLACE'S EQUATION AND NETWORK FLOWS,
AD-619 819 FLD. 12

•HUANG, T. S.
• • •
BOUNDS OF IMPEDANCE FUNCTIONS OF R, = L, = C, T NETWORKS
AD-616 091 FLD. 9

•HUBER, WILLIAM A.
• • •
MONOCYCLE POSITION MODULATION
AD-619 969 FLD. 9

•HUGGINS, R. A.
• • •
EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS,
AD-616 170 FLD. 6

•HUGHES, A. JAMES

• • •
ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM
AD-616 221 FLD. 20

•HULTGREN, BROR O.
• • •
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK: PHASE II
AD-615 904 FLD. 1

•HUMPHREYS, WILLARD C.
• • •
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

•HUTH, J. H.
• • •
ON ONE-DIMENSIONAL INVISCID MAGNETOHYDRODYNAMIC FLOW.
AD-616 398 FLD. 20
• • •
SPACE VEHICLE POWER PLANTS
AD-616 419 FLD. 22

•IAMPIETRO, P. F.
• • •
TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN
AD-616 164 FLD. 6

•IMHOF, W. L.
• • •
VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES,
AD-616 179 FLD. 4

•INCE, W. J.
• • •
HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER
AD-616 132 FLD. 9

•INDIK, BERNARD P.
• • •
THREE STUDIES OF ORGANIZATIONAL AND INDIVIDUAL DIMENSIONS OF ORGANIZATIONS,
AD-615 796 FLD. 5

•IRVIN, J. C.
• • •
MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

•ISACKS, BRYAN
• • •
SEISMIC WAVES WITH FREQUENCIES FROM 1 TO 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY.
AD-615 834 FLD. 8

•JACAVANCO, DANIEL J.
• • •
ELECTROMAGNETIC PROPERTIES OF A PLASMACOVERED ANTENNA.
AD-616 123 FLD. 9

•JACKSON, DARRELL R.
• • •
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 909 FLD. 17

•JACOBS, M. S.
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,
AD-616 089 FLD. 6

•JANES, G. SARGENT
• • •
THERMAL ELECTRON IMPACT IONIZATION RATE CALCULATION FOR H, H2, HE, N2, O2, NO2, AR, AND HG.
AD-615 888 FLD. 20

•JANUS, A. R.
• • •
MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES,
AD-616 211 FLD. 7

•JARVIS, N. L.
• • •
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS.
AD-616 238 FLD. 7

•JASPERSE, J.
• • •
CHARACTERISTICS OF METAL VAPORS,
AD-616 110 FLD. 20

•JASWAL, S. S.
• • •
LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTITUTIONAL MASS DEFECTS IN SODIUM IODIDE
AD-616 058 FLD. 20

•JEFFRESS, LLOYD A.
• • •
EFFECT OF NOISE CROSSCORR ELATION ON BINAURAL SIGNAL DETECTION,
AD-615 830 FLD. 17

•JENSON, M. A.
• • •
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 055 FLD. 20

•JERVIS, HELEN R.
• • •
A KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE,
AD-616 139 FLD. 6

•JOHLER, J. R.
• • •
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTR OMAGNETIC PULSE,
AD-615 937 FLD. 20

•JOHLER, J. RALPH
• • •
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT,
AD-615 938 FLD. 20

•JOHNSON, GEORGE D.
• • •
LOW-NOISE L-BAND AMPLIFIER.
AD-616 331 FLD. 9

•JOHNSON, K.
• • •
IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS
AD-616 047 FLD. 20

•JOHNSON, L.
• • •
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

•JOHNSON, LAVERNE C.
• • •
GALVANIC SKIN RESPONSE AFTER SLEEP DEPRIVATION,
AD-616 028 FLD. 5

•JOHNSON, PHILIP L.
• • •
PEDO-ECOLOGICAL INVESTIGATIONS, BARROW, ALASKA,
AD-615 998 FLD. 8

•JOHNSON, SELMER M.
• • •
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6

•JOHNSON, WAINE C.
• • •
CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY,
AD-616 029 FLD. 6

•JONES, RONALD E.
• • •
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
AD-615 769 FLD. 14

•JONES, WALLACE A.
• • •
OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS,
AD-616 029 FLD. 6

•KABANOV, V. V.
• • •
STABILITY OF AN ANISOTROPIC CIRCULAR CYLINDRICAL SHELL DURING LONGITUDINAL COMPRESSION, INTERNAL PRESSURE AND IRREGULAR HEATING IN LENGTH,
AD-615 872 FLD. 20

•KALABA, ROBERT
• • •
SOME ASPECTS OF ADAPTIVE CONTROL PROCESSES,
AD-616 371 FLD. 12
• • •
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY, V: DIFFUSION AS A LIMITING CASE,
AD-616 403 FLD. 20
• • •
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

•KANA, WILLIAM N.
• • •
EFFECT OF AUGMENTED TELEVISION DEPTH CUES ON THE TERMINAL PHASE OF REMOTE DRIVING.
AD-615 929 FLD. 6

•KANO, Y.
• • •
TEMPORAL COHERENCE OF BLACK BODY RADIATION,
AD-616 223 FLD. 20

•KAPLAN, NORMAN M.
• • •
AN INDEX OF SOVIET INDUSTRIAL OUTPUT.
AD-616 412 FLD. 5

•KAPLOW, ROY
• • •
LOCAL ORDER IN LIQUID ALLOYS,
AD-616 277 FLD. 11

•KATZ, ALAN M.
• • •
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION
AD-615 972 FLD. 4

•KATZ, IRVING

• • •
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES
AD-615 828 FLD. 15

•KAUFFMANN, R. A.
• • •
A STANDARD ARMY MICROWAVE POWER CALIBRATION SYSTEM FOR THE 26.5 TO 40 GIGACYCLE RANGE.
AD-616 270 FLD. 14

•KAUFMAN, WILLIAM C.
• • •
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

•KAZANTSEV, A. N.
• • •
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES)
AD-616 130 FLD. 20

•KELLEHER, GRACE J.
• • •
A DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY,
AD-615 779 FLD. 15

•KELLER, H. B.
• • •
COMPUTERS IN SOLID MECHANICS: A CASE HISTORY,
AD-615 837 FLD. 20

•KELLER, R.
• • •
HIGH-ENERGY BATTERY SYSTEM STUDY.
AD-616 389 FLD. 10

•KELLOGG, WILLIAM W.
• • •
THE UPPER ATMOSPHERE AS OBSERVED WITH ROCKETS AND SATELLITES.
AD-616 374 FLD. 4

•KELLY, P. S.
• • •
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

•KENNEALY, JOHN P.
• • •
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 335 FLD. 7

•KERR, D. M. , JR.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
AD-615 940 FLD. 9

•KERREBROCK, J. L.
• • •
NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO-PHASE METAL VAPORS,
AD-616 162 FLD. 21

•KHALILOV, T. A.
• • •
SYNTHESIS OF AUTOMATIC CONTROL SYSTEMS BY THE METHOD OF SUCCESSIVE APPROXIMATIONS
AD-615 869 FLD. 14

•KHORANA, BRIJ M.
• • •
BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS,
AD-616 022 FLD. 20

•KHRISTIANOVICH, S. A.
• • •
LOW-TEMPERATURE PLASMA GENERATORS,
AD-616 310 FLD. 20

•KHVEDELYANI, YA. R.
• • •
AUTOMATIC GAMMA FLAW DETECTOR,
AD-615 992 FLD. 14

•KHVOSTOV, O. P.
• • •
COMPENSATION DEVICE,
AD-615 987 FLD. 20

•KILDIBEKOV, I. G.
• • •
STUDYING THE BEHAVIOR OF SHELLS AND PLATES UPON IMPACT,
AD-615 871 FLD. 20

•KILMISTER, C. W.
• • •
IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS,
AD-616 200 FLD. 20

•KISLIK, M. L.
• • •
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX,
AD-615 896 FLD. 22

•KLEIN, EDMUND
• • •
LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE,
AD-616 069 FLD. 6

•KLESTOVA, Z. D.
• • •
SELECTION OF FLUX FOR WELDING HIGHSTRENGTH STEEL
AD-616 281 FLD. 13

•KLIPHUIS, J.
• • •
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-615 907 FLD. 5

•KLOBUCHAR, J. A.
• • •
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

•KLUSMANN, E. B.
• • •
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS.
AD-616 101 FLD. 11

•KNIPE, R. H.
• • •
STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION,
AD-616 149 FLD. 21

•KNOTT, S. T.
• • •
NARRATIVE OF CHAIN CRUISE NO. 43, 15 FEBRUARY21 AUGUST 1964.
AD-616 392 FLD. 8

•KOBER, E. H.
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID.
AD-615 774 FLD. 11

•KOHN, W.
• • •
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS,
AD-615 799 FLD. 20

•KOICKI, A.
• • •
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM IRON GARNET,
AD-616 229 FLD. 20

•KOICKI, S.
• • •
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM IRON GARNET,
AD-616 229 FLD. 20

•KOLBACK, S. A.
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID.
AD-615 774 FLD. 11

•KOLBANOVSKII, YU. A.
• • •
RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF TICL4,
AD-615 983 FLD. 7

•KOLKER, I. I.
• • •
USING THE METHOD OF FLUORESCENT ANTIBODIES TO INVESTIGATE THE ANTIGEN-ANTIBODY REACTION IN TISSUES: STUDYING THE LOCALIZATION OF ANTINEPHRITIC AND ANTIHEPATIC ANTIBODIES IN HOMO-AND HETEROLOGOUS TISSUES
AD-615 873 FLD. 6

•KOPEV, I. M.
• • •
STRENGTH OF THIN METAL FIBERS.
AD-615 879 FLD. 20

•KOPPEL, J. L.
• • •
THE RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS,
AD-616 177 FLD. 6
• • •
PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA,
AD-616 178 FLD. 6

•KOPPEL, JOHANNES L.
• • •
SPECTROPHOTOMETRIC MODIFICATION OF THE TANE ASSAY FOR PROTHROMBIN,
AD-616 180 FLD. 6

•KORATSKAYA, A. I.
• • •
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES)
AD-615 982 FLD. 11

•KOROTKIN, ARTHUR L.
• • •
INDEXING AIDS, PROCEDURES AND DEVICES.
AD-616 342 FLD. 9

•KORSHAK, V. V.
• • •
SYNTHESIS AND INVESTIGATION OF PROPERTIES OF CERTAIN HOMOGENEOUS AND MIXED POLYBENZIMIDA

ZOLES,
AD-619 865 FLD. 11

•KOSTIN, S. I.
• • •
IS THE BRIKNER (BRUECKNER) CYCLE REAL,
AD-619 768 FLD. 4

•KOTON, M. M.
• • •
DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN,
AD-619 991 FLD. 7

•KRAFT, MAX A.
• • •
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES,
AD-616 269 FLD. 9

•KRASOVSKII, A. A.
• • •
THERMAL NOISE OF MEASURING DEVICES AND LIMITING ACCURACY SELF-CONTAINED GUIDANCE OF A SPACE SHIP,
AD-619 861 FLD. 22

•KREEVOY, MAURICE M.
• • •
THE EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL COMPONENT,
AD-616 187 FLD. 7

•KRIEBEL, CHARLES H.
• • •
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZ ATION,
AD-616 112 FLD. 13
• • •
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS,
AD-616 113 FLD. 12

•KROTENOK, P. I.
• • •
ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION,
AD-619 876 FLD. 11

•KRUGER, P.
• • •
EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS,
AD-616 012 FLD. 20

•KRYTER, KARL D.
• • •
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER-RIFLES,
AD-619 934 FLD. 6

•KUBASOV, V. N.
• • •
OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT,
AD-619 898 FLD. 22

•KUDRYAVTSEV, G. I.
• • •
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES)
AD-619 982 FLD. 11

•LANDESMAN, H.
• • •
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS,
AD-616 101 FLD. 11

•LANDEZ, J. H.
• • •
THE EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMINES AS INFLUENCED BY PARGYLINE HYDROCHLORIDE AND IPRONIAZID PHOSPHATE,
AD-616 198 FLD. 6

•LANDISMAN, MARK
• • •
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS,
AD-619 833 FLD. 8

•LANGFORD, TED L.
• • •
EFFECT OF NOISE CROSSCORR ELATION ON BINAURAL SIGNAL DETECTION,
AD-619 830 FLD. 17

•LAPUSHKA, K. K.
• • •
ARRANGEMENT FOR PHOTOGRAPHING ARTIFICIAL EARTH SATELLITES
AD-616 307 FLD. 22

•LAWLEY, ALAN
• • •
DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION,
AD-616 392 FLD. 11

•LAWSON, MELVIN E. , JR.
• • •
RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER,
AD-619 911 FLD. 19

•LAXPATI, S. R.
• • •
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY,
AD-619 827 FLD. 9

•LEBEDEV, V. N.
• • •
SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT,
AD-619 887 FLD. 22

•LEDERLE, H. F.
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID,
AD-619 774 FLD. 11

•LEE, H. B.
• • •
BOUNDS OF IMPEDANCE FUNCTIONS OF R, = L, = C, T NETWORKS
AD-616 091 FLD. 9

•LEE, HAI SUP
• • •
THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTER ACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964,
AD-619 764 FLD. 20

•LEE, HANS E.
• • •
RELATION BETWEEN TALKING AND SOCIOMETRIC CHOICES,
AD-616 293 FLD. 5

•LEE, T. H.
• • •
SPHERICAL WAVES IN VISCOE LASTIC MEDIA,
AD-619 999 FLD. 20

•LEHTO, DELBERT L.
• • •
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS,
AD-619 801 FLD. 20

•LEVER, WALTER F.
• • •
LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE,
AD-616 069 FLD. 6

•LEVIN, E.
• • •
MANNED CONTROL OF ORBITAL RENDEZVOUS,
AD-616 902 FLD. 22

•LEVINE, HAROLD
• • •
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY,
AD-616 099 FLD. 20

•LEVI-SETTI, R.
• • •
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>8
AD-616 096 FLD. 20

•LEVY, JORGE
• • •
RADIO ASTRONOMICAL OBSERV ATIONS FROM A CANYON,
AD-616 195 FLD. 3

•LEWIS, M. B.
• • •
KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES,
AD-616 092 FLD. 20

•LI, TING Y.
• • •
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER
AD-619 949 FLD. 1

•LILGA, KENNETH T.
• • •
PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACID IRRADIATED AT LOW TEMPERATURE
AD-616 063 FLD. 20

•LINCOLN, R. S.
• • •
AN INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS
AD-616 316 FLD. 6

•LING, F. F.
• • •
FATIGUE FAILURE OF SURFACE FILMS,
AD-616 291 FLD. 20

•LINSTEADT, GEORGE F.
• • •
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR,
AD-616 119 FLD. 13

•LIPKIN, H. J.
• • •
VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
AD-616 097 FLD. 20

•LIVINGSTON, CLIFTON W.

• • •
PENETRATION OF PROJECTILES INTO FROZEN GROUND,
AD-616 348 FLD. 19

•LONGEVIALLE, PIERRE
• • •
THE STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES,
AD-616 337 FLD. 7

•LOOMIS, HAROLD G.
• • •
A DESCRIPTION OF THE FESTSA SYSTEM,
AD-616 004 FLD. 9

•LOWE, LESTER F.
• • •
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

•LUCAS, A. L.
• • •
CRUSTAL STRUCTURE OF GREAT BRITAIN,
AD-616 093 FLD. 8

•LUDWIG, C. B.
• • •
SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.3-MICRON FUNDAMENTAL BAND OF H2O,
AD-616 089 FLD. 20

•LUGT, HANS J.
• • •
ON THE BIRTH AND DECAY OF VORTICES,
AD-615 770 FLD. 20

•LUND, J. W.
• • •
GAS BEARING DESIGN CHARTS. VOLUME 2. THE HYDROSTATIC GAS JOURNAL BEARING AND THE HYDROSTATIC GAS THRUST BEARING.
AD-615 920 FLD. 13

•LUSHNIKOV, F.
• • •
AN EXPLOIT WHICH HUMANITY WILL NOT FORGET. FROM THE LOGBOOKS OF FLIERS-COSMONAUTS V. BYKOVSKII AND V. TERESHKOVA
AD-615 988 FLD. 16

•LUTZKY, MORTON
• • •
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS,
AD-615 801 FLD. 20

•LYAMICHEV, I. YA.
• • •
ELEMENTS OF AN ELECTROLUM INESCENT SCREEN,
AD-616 268 FLD. 17

•LYATIFOVA, L. A.
• • •
CATALYSIS OVER AN ORGANIC SEMICONDUCTOR, OBTAINED ON THE BASIS OF POLYACRYLONITRILE
AD-615 989 FLD. 7

•LYONS, LILLIAN V.
• • •
SPECTROPHOTOMETRIC MODIFICATION OF THE TAME ASSAY FOR PROTHROMBIN,
AD-616 180 FLD. 6

•LYTTON, J. L.
• • •
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER
AD-615 926 FLD. 11

•LYUBAVSKII, K. V.
• • •
SELECTION OF FLUX FOR WELDING HIGHSTRENGTH STEEL
AD-616 241 FLD. 13

•LYUDKOVSKII, I. G.
• • •
SOME CHIEF RESULTS OF INVESTIGATIONS ON THE APPLICATION OF REINFORCED CONCRETE IN HEAVY MACHINE BUILDING AND PRESS CONSTRUCTION,
AD-615 853 FLD. 13

•MACDOUGALL, J. B.
• • •
INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 356 FLD. 9

•MACKENSIE, L.
• • •
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

•MACKENZIE, L. A.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION
AD-616 001 FLD. 9

•MACLEOD, MALCOLM A.
• • •
THE EVOLUTION OF AN IONOSPHERIC HOLE.
AD-615 969 FLD. 4

•MADANSKY, ALBERT
• • •
PARAMETER-FREE AND NONPARAMETRIC TOLERANCE LIMITS: THE EXPONENTIAL CASE.
AD-616 369 FLD. 12

•MADDEN, PAUL A.
• • •
AN EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
AD-615 922 FLD. 1

•MAHIN, H. P.
• • •
FEMORAL HERNIA IN CHILDREN
AD-616 155 FLD. 6

•MAHR, HERBERT
• • •
LIFETIME OF THE EXCITED F(-) CENTER IN KCl,
AD-616 082 FLD. 20

•MAILLOUX, ROBERT J.
• • •
THE LONG YAGI-UDA ARRAY
AD-615 803 FLD. 9

•MALDONADO, C. D.
• • •
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
AD-616 353 FLD. 20

•MALINOFSKY, WALTER W.
• • •
CONTROL AND REPRODUCIBILITY OF FERRITES PREPARED BY THE FLAME SPRAY-HOT PRESS TECHNIQUE
AD-615 807 FLD. 11

•MANGELSDORF, J. E.
• • •
AN INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS
AD-616 316 FLD. 6

•MARKOWITZ, H. M.
• • •
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS,
AD-616 240 FLD. 9

•MARSCHAK, THOMAS A.
• • •
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES
AD-616 928 FLD. 5

•MASON, R. M.
• • •
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER.
AD-615 811 FLD. 9

•MASON, RAYMOND J.
• • •
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT.
AD-615 948 FLD. 15

•MASSELL, B. F.
• • •
TOWARD A GENERAL THEORY OF CUSTOMS UNION FOR DEVELOPING COUNTRIES,
AD-616 309 FLD. 5

•MATHER, JOHN R.
• • •
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART I. ANALYSIS,
AD-616 355 FLD. 4
• • •
RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART II. BIBLIOGRAPHY.
AD-616 396 FLD. 4

•MATTHEWS, P. T.
• • •
SU(6) AND CHARGE FORM FACTORS,
AD-616 051 FLD. 20

•MATTHIAS, B. T.
• • •
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 059 FLD. 20

•MAXWELL, E. L.
• • •
10 KC/S ATMOSPHERIC NOISE PREDICTIONS,
AD-615 923 FLD. 4

•MAY, JACQUES M.
• • •
THE ECOLOGY OF MALNUTRITION IN MIDDLE AFRICA (GHANA, NIGERIA, REPUBLIC OF THE CONGO, RWANDA BURUNDI, AND THE FORMER FRENCH EQUATORIAL AFRICA), VOLUME V.
AD-616 287 FLD. 6

•MAY, JORGE
• • •
RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON,
AD-616 195 FLD. 3

•MAYER, MANFRED M.
• • •
THE STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS: APPLICATION TO THE ENUMERATION OF SAC'4
AD-616 201 FLD. 6

•MAYER, MEINHARD E.
• • •
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
AD-616 206 FLD. 20

•MCALEVY, ROBERT F. , III
• • •
LINEAR PYROLYSIS OF THERM OPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 892 FLD. 11

•MCCLOSKEY, JAMES A.
• • •
THE STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVA TIVES,
AD-616 337 FLD. 7

•MCCOY, J. E.
• • •
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61,
AD-616 314 FLD. 13

•MCCULLOCH, WARREN S.
• • •
THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY
AD-616 334 FLD. 5

•MCEVILLY, T. V.
• • •
CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE VELOCITY INVERSION.
AD-615 839 FLD. 8

•MCFARLAND, L. L.
• • •
TEST AND EVALUATION OF AN M-191 AIR CUSHION CONVERSION KIT.
AD-616 109 FLD. 1

•MCFARLANE, S. H. , III
• • •
GROWTH OF DISLOCATION-FREE GALLIUM CRYSTALS.
AD-616 258 FLD. 20

•MCGOWAN, R. J.
• • •
EXPERIMENTS IN THE IDENTI FICATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
AD-615 951 FLD. 14

•MCINTIRE, WILLIAM G.
• • •
BEACH PROCESS STUDIES. PART B. BEACH CUSPS,
AD-616 141 FLD. 8
• • •
SOUTHERN HEMISPHERE BEACH ROCK,
AD-616 231 FLD. 8

•MCKENZIE, ANN T.
• • •
THE STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS: APPLICATION TO THE ENUMERATION OF SAC'4
AD-616 201 FLD. 6

•MEAKIN, JOHN D.
• • •
DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION.
AD-616 392 FLD. 11

•MEASOR, A. B.
• • •
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
AD-616 264 FLD. 9

•MEDRUD, R. C.
• • •
THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 033 FLD. 20

•MEIGHAN, THOMAS W.
• • •
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
AD-615 921 FLD. 5

•MELKANOFF, M. A.
• • •
ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES,
AD-616 079 FLD. 20
• • •
EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS,
AD-616 080 FLD. 20

•MELLOR, MALCOLM
• • •
SNOW REMOVAL AND ICE CONTROL,
AD-615 798 FLD. 13

•MENDERSHAUSEN, HORST
• • •
THE TERMS OF SOVIET-SATELLITE TRADE: A BROADENED ANALYSIS,
AD-616 430 FLD. 5

•MENYUK, N.
• • •
MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS
AD-616 041 FLD. 8

•MEREND, M.
• • •
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY USS AUSTIN (LPD-4),
AD-616 237 FLD. 13

•MERRILL, ROY DEWITT , JR.
• • •
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC,
AD-616 329 FLD. 9

•MESHKOV, N.
• • •
VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
AD-616 097 FLD. 20

•METZNER, A. B.
• • •
CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH APPLICATION TO RAPID EXTERNAL FLOWS.
AD-616 083 FLD. 20

•MEUBESE, WILLEM
• • •
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS,
AD-616 327 FLD. 5

•MIDDLESTEAD, R.
• • •
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
AD-616 264 FLD. 9

•MIHRAN, T. G.
• • •
INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

•MIKHAILOV, F. A.
• • •
CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION,
AD-615 859 FLD. 22

•MILES, D. O.
• • •
SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS,
AD-616 147 FLD. 20

•MILLER, A. T. , JR.
• • •
SOME EFFECTS OF ANOXIA ON TISSUE METABOLISM,
AD-616 101 FLD. 6

•MILLER, M. K.
• • •
ACOUSTIC WAVE MOTION ALONG A PERIODIC SURFACE,
AD-616 060 FLD. 20

•MILLER, R. D.
• • •
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE
AD-616 319 FLD. 20

•MILLER, R. L.
• • •
THE ANGLE OF REPOSE OF A SINGLE GRAIN ON A FIXED ROUGH BED,
AD-615 787 FLD. 8

•MINGINS, CHARLES R.
• • •
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-615 810 FLD. 20

•MINUTI, D. V.
• • •
INVESTIGATION OF TRANSPARENT FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICA TIONS,
AD-615 881 FLD. 13

•MITTRA, R.
• • •
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY,
AD-615 827 FLD. 9

•MIXON, L. W.
• • •
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•MIZUTANI, KAZUO
• • •
ON ECONOMIC ENTROPY,
AD-616 292 FLD. 5

•MOISEEV, N. N.
• • •
SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT,
AD-615 857 FLD. 22

•MOLCHANOV, I. N.
• • •
ON METHODS OF ECONOMIZING THE MEMORIES OF DIGITAL COMPUTERS WHEN SOLVING DIFFERENTIAL EQUATION SYSTEMS,
AD-616 309 FLD. 9

•MOMENT, ROGER L.
• • •
ENERGY OF GRAIN BOUNDARIES IN HALITE.
AD-616 049 FLD. 11

•MOORE, R. C.
• • •
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT,
AD-615 949 FLD. 3

•MOORE, WILLIAM H.
• • •
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 335 FLD. 7

•MOORSTEEN, RICHARD H.
• • •
AN INDEX OF SOVIET INDUSTRIAL OUTPUT.
AD-616 412 FLD. 5

•MORGENSTERN, J. C.
• • •
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTR OMAGNETIC PULSE,
AD-615 937 FLD. 20

•MOROFF, SAUL V.
• • •
EFFECTS OF OVERHYDRATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT,
AD-616 165 FLD. 6

•MORRIS, CLAIR R.
• • •
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
AD-615 953 FLD. 17

•MORRIS, J. H.
• • •
HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
AD-616 188 FLD. 7

•MORRISON, N.
• • •
THE GYRATION OPERATOR IN NETWORK THEORY,
AD-616 329 FLD. 9

•MORSE, ROBERT W.
• • •
STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM.
AD-616 203 FLD. 20

•MOSLEY, EVERETT C.
• • •
THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION
AD-616 139 FLD. 6

•MUELLER, E. A.
• • •
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
AD-615 772 FLD. 4

•MUENCH, H. STUART
• • •
STRATOSPHERIC ENERGY PROCESSES AND ASSOCIATED ATMOS PHERIC LONG-WAVE STRUCTURE IN WINTER.
AD-616 124 FLD. 4

•MUNN, R. J.
• • •
AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL,
AD-616 228 FLD. 20

•MUNSE, W. H.
• • •
EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 034 FLD. 13
• • •
FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 039 FLD. 13

•MUNSON, ALBERT G.
• • •
THE VORTICAL LAYER ON AN INCLINED CONE,
AD-616 204 FLD. 1

•MURPHY, E.
• • •
INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 356 FLD. 9

•MURRAY, S. F.
• • •
GAS BEARING DESIGN CHARTS, VOLUME 1. THE HYDRODYNAMIC GAS JOURNAL BEARING AND THE HYDRODYNAMIC GAS THRUST BEARING.
AD-615 919 FLD. 13

•MURZINOV, I. N.
• • •
NEWS OF THE ACADEMY OF SCIENCES OF THE USSR. MECHANICS AND MACHINE BUILDING, NO. 1, 1964 (SELECTED ARTICLES)
AD-615 990 FLD. 20

•MYERS, R. J.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
AD-615 940 FLD. 9

•NAGIBINA, I. M.
• • •
DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE,
AD-615 864 FLD. 20

•NAGY, A. R. , JR.
• • •
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

•NAGY, D.
• • •
THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION
AD-616 202 FLD. 20

•NAKAJIMA, K.
• • •
CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
AD-616 068 FLD. 20

•NAKAMOTO, KAZUO
• • •
NORMAL COORDINATE ANALYSES OF HYDROGENBONDED COMPOUNDS, III. THE ACID MALEATE ION
AD-616 074 FLD. 7

•NARAYAN, S. Y.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
AD-615 940 FLD. 9

•NASH, G.
• • •
CRACK INITIATION IN METALLIC MATERIALS.
AD-615 786 FLD. 11

•NAZAROV, S. Y.
• • •
WAYS FOR THE AUTOMATION OF NONDESTRUCTIVE WELD-JOINT INSPECTION METHODS,
AD-615 999 FLD. 13

•NEAL, JAMES T.
• • •
GEOLOGY, MINERALOGY, AND HYDROLOGY OF U. S. PLAYAS.
AD-616 243 FLD. 8

•NEAVE, CHARLES
• • •
REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964,
AD-616 014 FLD. 6

•NEISWENDER, ROSEMARY
• • •
GUIDE TO RUSSIAN REFERENCE AND LANGUAGE AIDS: AN ANNOTATED BIBLIOGRAPHY.
AD-616 404 FLD. 5

•NEMETH, J.
• • •
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•NESMEYANOV, A. N.
• • •
ALPHA-FERROCENYLCARBONIUM SALTS,
AD-615 870 FLD. 7

•NEVEL, DONALD E.
• • •
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION,
AD-616 313 FLD. 13

•NEWKIRK, H. L.
• • •
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
AD-616 118 FLD. 22

•NEWMAN, W. E.
• • •
SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y),
AD-616 043 FLD. 20

•NEWSTEIN, M. C.
• • •
THEORETICAL RESEARCH ON LASER OSCILLATION.

AD-615 804 FLD. 20

•NG, TR. BY N. H.
• • •
ACTA GEOPHYSICA SINICA, VOL. 12, NO. 2, 1963: TABLE OF CONTENTS AND ABSTRACT, AD-616 114 FLD. 8

•NIAZI, MANSOUR
• • •
UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES AD-616 298 FLD. 8

•NICHOLAIDES, S.
• • •
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS, AD-616 330 FLD. 19

•NICHOLS, DUANE C.
• • •
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM. AD-615 979 FLD. 6

•NICHOLS, IVAN A.
• • •
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS. AD-616 099 FLD. 20

•NICHOLSON, H. M.
• • •
HIGH-ENERGY BATTERY SYSTEM STUDY. AD-616 389 FLD. 10

•NICKERSON, RAYMOND S.
• • •
STEPS TOWARD COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR, AD-616 294 FLD. 9

•NIEDRINGHAUS, LANDON
• • •
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW, AD-615 997 FLD. 14

•NIKITIN, B.
• • •
IN AIR TURBULENCES, AD-615 993 FLD. 1

•NIKOLAYEVA-TERESHKOVA, VALENTINA
• • •
THE UNIVERSE: AN OPEN SEA, AD-615 863 FLD. 22

•NIKOLENKO, L. D.
• • •
ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE, AD-615 874 FLD. 16

•NISKANEN, W. A.
• • •
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION AD-616 280 FLD. 15
• • •
TAXATION AND THE DEMAND FOR ALCOHOLIC BEVERAGES, AD-616 929 FLD. 9

•NISONOFF, A.
• • •
LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY AD-615 835 FLD. 6

•NOAH, J. W.
• • •
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES. AD-616 399 FLD. 13

•NODVIK, J. S.
• • •
EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS, AD-616 080 FLD. 20

•NORDQUIST, LAWRENCE E.
• • •
PEM FOR PRODUCTION OF FLUORINATED BARIUM TITANATE CAPACITORS FOR OPERATION TO 200C, AD-615 899 FLD. 9

•NOVICK, DAVID
• • •
THE FEDERAL BUDGET AS AN INDICATOR OF GOVERNMENT INTENTIONS AND THE IMPLICATIONS OF INTENTIONS, AD-616 367 FLD. 15

•NOVOSELOV, V. S.
• • •
OPTIMUM TWO-PULSE PASSAGE BETWEEN ORBITS WITH SMALL INCLINATIONS AND ECCENTRICITIES AD-616 282 FLD. 22

•NOWAK, RICHARD T.
• • •
IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER, AD-616 087 FLD. 8

•NUESE, C. J.
• • •
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS, AD-616 002 FLD. 20

•NUPEN, WILHELM
• • •
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES AD-615 936 FLD. 20

•NUTTLI, OTTO
• • •
TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE, AD-615 838 FLD. 8

•ODLE, R. L.
• • •
HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE, AD-616 208 FLD. 14

•OLIVER, JACK
• • •
SEISMIC WAVES WITH FREQUENCIES FROM 1 TO 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY, AD-615 834 FLD. 8

•OLIVER, LAWRENCE H.
• • •
INDEXING AIDS, PROCEDURES AND DEVICES. AD-616 342 FLD. 9

•OLIVER, R. J.
• • •
THE PACIFIC MARINE STATION SEA WATER SYSTEM. AD-615 788 FLD. 14

•OLSEN, H. N.
• • •
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC. AD-616 393 FLD. 20

•OLWIN, JOHN H.
• • •
THE RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS, AD-616 177 FLD. 6
• • •
PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA, AD-616 178 FLD. 6
• • •
SPECTROPHOTOMETRIC MODIFI CATION OF THE TAME ASSAY FOR PROTHROMBIN, AD-616 180 FLD. 6

•ORR, COY D.
• • •
THIN FILMS FORMED BY ELECTROCHEMICAL REACTIONS, AD-615 808 FLD. 9

•ORSINO, R. J.
• • •
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS. AD-616 117 FLD. 9

•ORTH, ROBER W.
• • •
FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE, AD-615 909 FLD. 17

•OSBORN, J. R.
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES. AD-615 816 FLD. 21
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES. AD-616 098 FLD. 21

•OSTROBER, V.
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS, AD-616 089 FLD. 6

•OTTE, HENRY M.
• • •
THE FORMATION, BEHAVIOR, AND PROPERTIES OF STACKING FAULTS IN CRYSTALLINE MATERIALS AD-615 917 FLD. 11

•OTTMANN, G. F.
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID. AD-615 774 FLD. 11

•O'NEILL, A.
• • •
EFFECT OF L-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THE VALSALVA MANEUVER, AD-615 843 FLD. 6

•PAGELS, HEINZ
• • •
SPIN AND GRAVITATION AD-616 217 FLD. 20

•PAKSHVER, A. B.
• • •
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES) AD-615 982 FLD. 11

•PALMER, J.
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,

AD-616 089 FLD. 6

•PANELLA, R. F.
• • •
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21

•PANSKY, B.
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,
AD-616 089 FLD. 6

•PAPAYOANOU, ARISTOTLE
• • •
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES,
AD-616 360 FLD. 4

•PAPETTI, S.
• • •
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-M-CARBORANYLENESILOXANES,
AD-615 819 FLD. 7

•PARELLO, JOSEPH
• • •
THE STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES,
AD-616 337 FLD. 7

•PARKS, J. K.
• • •
OPTICAL-CORRELATION DETECTOR FOR THE AUDIO FREQUENCY RANGE
AD-616 065 FLD. 17

•PARKS, V. J.
• • •
AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•PASSEY, GEORGE E.
• • •
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
AD-615 921 FLD. 5

•PAWLAK, JOSEPH C.
• • •
ORGANIC DEPOLARIZED PRIMARY BATTERIES.
AD-616 120 FLD. 10

•PAYNE, PETER R.
• • •
CURVED JET FLOWS, VOLUME II.
AD-616 357 FLD. 1

•PAYO, GONZALO
• • •
CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION
AD-616 016 FLD. 8

•PEARSON, J. J.
• • •
SPATIAL VARIATION OF THE MAGNETIZATION ACROSS A FERROMAGNETIC THIN FILM IN THE BETHE-PEIERLS-WEISS APPROXIMATION,
AD-616 196 FLD. 20

•PECORA, R.
• • •
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. I. X RAYS AND NEUTRONS,
AD-616 189 FLD. 20

• • •
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. II. LIGHT,
AD-616 190 FLD. 20

•PELEG, BEZALEL
• • •
COMPOSITION OF GENERAL SUM GAMES.
AD-616 319 FLD. 5

•PERING, N.
• • •
A HIGH CURRENT INVESTIGATION OF A 10 MEV SBAND ELECTRON LINEAR ACCELERATOR.
AD-615 915 FLD. 18

•PERRY, ROBERT W.
• • •
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-615 810 FLD. 20

•PERSSON, EDITH
• • •
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

•PETERSON, NORMAN E.
• • •
THE OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS,
AD-615 836 FLD. 6

•PETRITZ, R. L.
• • •
LOW-NOISE L-BAND AMPLIFIER.
AD-616 321 FLD. 9

•PETTY, CHARLES S.
• • •
NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOPOIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST
AD-616 026 FLD. 6

•PEYTON, E. L.
• • •
THE OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS,
AD-615 836 FLD. 6

•PIKE, CHARLES P. , JR.
• • •
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

•PIRANI, F. A. E.
• • •
IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS,
AD-616 200 FLD. 20

•PISA, E. J.
• • •
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES,
AD-616 271 FLD. 20

•PITTELLI, ERNEST
• • •
INVESTIGATION F ULTR HIGH VACUUM SPUTTERED THIN FILMS,
AD-615 971 FLD. 20

•PLASS, GILBERT N.
• • •
MIE SCATTERING AND ABSORPTION CROSS SECTIONS FOR ABSORBING PARTICLES,
AD-616 343 FLD. 20

•PLATONOV, A. K.
• • •
OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT,
AD-615 858 FLD. 22

•POLAK, L. S.
• • •
RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF TICL4,
AD-615 983 FLD. 7

•POLUTCHKO, ROBERT J.
• • •
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK: PHASE II
AD-615 904 FLD. 1

•POMERANTZ, M.
• • •
PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

•PORT, SIDNEY C.
• • •
LIMIT THEOREMS INVOLVING CAPACITIES FOR RECURRENT MARKOV CHAINS,
AD-615 980 FLD. 12

•PORTER, DAVID T.
• • •
EFFECT OF THEVENIN EQUIVALENT INTERNAL IMPEDANCE ON VELOCITY CONTROL AND ACOUSTIC POWFOR PLANAR BROADSIDE ARRAYS FOR DIFFERENT DRIVING LEVEL LIMITATIONS.
AD-615 773 FLD. 17

•PORTEUS, J. O.
• • •
OPTIMUM RC FILTERING AND INTEGRATION FOR SEQUENTIAL MEASUREMENT OF DC SIGNALS
AD-616 191 FLD. 14

•POWERS, R. J.
• • •
EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 023 FLD. 20

•PRASAD, BALRAM
• • •
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

•PRATT, A. V.
• • •
THEORY OF THE UNSYMMETRIC NUTATION DAMPER,
AD-615 889 FLD. 20

•PRATT, H. J.
• • •
HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER
AD-616 132 FLD. 9

•PREGLER, J. E.
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID.
AD-615 774 FLD. 11

•PRESUTTI, VICTOR J. , JR.

• • •
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES
AD-615 828 FLD. 15

•PRINGLE, J. KENNETH
• • •
CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH,
AD-616 019 FLD. 8

•PROCTOR, THOMAS GILMER
• • •
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE,
AD-616 278 FLD. 12

•QUADE, E. S.
• • •
COST-EFFECTIVENESS: AN INTRODUCTION AND OVERVIEW
AD-616 339 FLD. 5

•RABOY, S.
• • •
EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 023 FLD. 20

•RAINEY, R. B.
• • •
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION
AD-616 380 FLD. 15

•RAMSDEN, S. A.
• • •
MEASUREMENT OF THE FARADAY EFFECT IN A THETA-PINCH PLASMA USING A HE-NE LASER,
AD-616 015 FLD. 20

•RAND, R. E.
• • •
ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11,
AD-616 193 FLD. 20

•RAPP, R. R.
• • •
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES
AD-616 400 FLD. 1

•RATNEY, RONALD S.
• • •
THE CHEMISTRY OF THE CELL WALLS OF BACILLUS ANTHRACIS: THE EFFECT OF PENICILLIN,
AD-616 198 FLD. 6

•RAUB, C. J.
• • •
ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUMGOLD (UBER DIE KRISTALLSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-GOLD UND RUBIDIUM-GOLD),
AD-616 093 FLD. 20
• • •
SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM,
AD-616 094 FLD. 11
• • •
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 095 FLD. 20

•RAVEN, BERTRAM H.
• • •
A BIBLIOGRAPHY OF PUBLICATIONS RELATING TO THE SMALL GROUP,
AD-616 265 FLD. 5

•READ, LESLIE W.
• • •
LOW-NOISE L-BAND AMPLIFIER,
AD-616 221 FLD. 9

•REED, T. B.
• • •
ELECTRIC FURNACE FOR OPERATION IN OXIDIZING, NEUTRAL, AND REDUCING ATMOSPHERES TO 2400 C,
AD-616 139 FLD. 14

•REGEL, V. R.
• • •
THE EFFECT OF ULTRAVIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS,
AD-616 289 FLD. 11

•REGENER, VICTOR H.
• • •
(1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS,
AD-616 008 FLD. 4

•REGGIA, FRANK
• • •
C-BAND RECIPROCAL PHASE SHIFTERS AND AMPLITUDE MODULATORS
AD-615 778 FLD. 9

•REICHERT, JONATHAN
• • •
GATED INTEGRATOR FOR REPETITIVE SIGNALS,
AD-616 222 FLD. 14

•REICHERT, JONATHAN F.
• • •
DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM,
AD-616 218 FLD. 20

•REINERT, JOHN F.
• • •
THE OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS,
AD-615 836 FLD. 6

•REISS, E. L.
• • •
COMPUTERS IN SOLID MECHANICS: A CASE HISTORY,
AD-615 837 FLD. 20

•RICHARDSON, PETER D.
• • •
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION,
AD-616 102 FLD. 1

•RICKAYZEN, G.
• • •
CRITICAL MAGNETIC FIELD OF A THIN FILM OF SUPERCONDUCTOR
AD-615 850 FLD. 20

•RIDGLEY, D. H.
• • •
SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y),
AD-616 049 FLD. 20

•RILEY, WILLIAM F.
• • •
STRESSES AT TUNNEL INTERSECTIONS,
AD-616 018 FLD. 20

•ROBERTS, P. V.
• • •
INVESTIGATION OF FILTER CHARACTERISTICS OF ARRAYED CONDUCTORS BETWEEN GROUND PLANES,
AD-616 239 FLD. 9

•ROBERTS, SEAN C.
• • •
THE MARVEL PROJECT. PART E. A UNIQUE SOLUTION TO THE PROBLEM OF OBTAINING TWODIMENSIONAL BOUNDARY LAYER DATA ON THE VARIABLE-CAMBER HIGH-LIFT WINGS OF THE MARVELETTE AIRCRAFT.
AD-615 928 FLD. 1

•ROBERTS, SIDNEY
• • •
STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES,
AD-616 169 FLD. 6

•ROBINSON, A. R.
• • •
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE,
AD-616 000 FLD. 9

•ROBY, THORNTON J.
• • •
STEPS TOWARD COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR,
AD-616 299 FLD. 5

•ROE, T. , JR.
• • •
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS, VII,
AD-615 775 FLD. 6

•ROGERS, D. B.
• • •
MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS
AD-616 091 FLD. 8

•ROGUS, B. J.
• • •
DETECTION AND EVALUATION OF SURFACE DECARBURIZATION OF STEEL COMPONENTS BY MEANS OF ROCKWELL HARDNESS TEST PROCEDURES,
AD-615 823 FLD. 11

•ROHAN, P.
• • •
SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES,
AD-616 209 FLD. 20
• • •
COVARIANT MERGING OF SPIN AND UNITARY SPIN,
AD-616 207 FLD. 20

•ROSE, R. M.
• • •
RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM,
AD-616 020 FLD. 20

•ROSSITER, S. B.
• • •
EVALUATION OF PLAN FOR CENTRAL APPROACH CONTROL FACILITY AT JACKSONVILLE.
AD-615 952 FLD. 1

•ROSTOKER, W.
• • •
EMBRITTLEMENT OF METALS BY ORGANIC LIQUIDS.
AD-616 302 FLD. 11

•ROWE, A. W.
• • •
NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO-PHASE METAL VAPORS,
AD-616 162 FLD. 21

•RUBIN, HERMAN
• • •
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, E,TIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
AD-616 394 FLD. 4

•RUDNICK, PHILIP
• • •
THE MOTION OF A SPAR BUOY IN SWELL. PART I.
AD-615 882 FLD. 13
• • •
THE MOTION OF A SPAR BUOY IN SWELL. PART II.
AD-615 886 FLD. 13

•RUHNKE, LOTHAR H.
• • •
TESTING AND FURTHER DEVEL OPMENT OF AN ELECTRONIC CLOUD DETECTOR.
AD-616 347 FLD. 4

•RUSSELL, RICHARD J.
• • •
BEACH PROCESS STUDIES. PART B. BEACH CUSPS,
AD-616 141 FLD. 8
• • •
SOUTHERN HEMISPHERE BEACH ROCK,
AD-616 231 FLD. 8

•RUTLEDGE, L. C.
• • •
STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER,
AD-616 072 FLD. 6

•SAKAMOTO, H.
• • •
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM.
AD-615 908 FLD. 1

•SAKHAROVA, M. M.
• • •
CATALYSIS OVER AN ORGANIC SEMICONDUCTOR, OBTAINED ON THE BASIS OF POLYACRYLONITRILE
AD-615 989 FLD. 7

•SALAM, A.
• • •
ELECTROMAGNETIC AND WEAK INTERACTIONS,
AD-616 090 FLD. 20

•SALAM, ABDUS
• • •
GAUGE THEORY OF ELEMENTARY INTERACTIONS,
AD-616 059 FLD. 20

•SALAVA, ROGER F.
• • •
DATA TRANSMISSION INVESTI GATION (SHORT RANGE HF RADIO DATA TRANSMISSION).
AD-615 975 FLD. 17

•SALISBURY, JOHN T.
• • •
A STUDY ON THE APPLICATION OF MICROFILMING TO THE PRODUCTION, DISTRIBUTION, USE, AND RETRIEVAL OF TECHNICAL REPORTS.
AD-615 800 FLD. 5

•SAMS, CRAWFORD F.
• • •
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6

•SAMSON, E. W.
• • •
ON THE THEORY OF BOOLEAN FORMULAS! SUBFORMULAS AND SUBSTITUTION OPERATORS,
AD-616 122 FLD. 12

•SAMSONOVA, V. G.
• • •
OPPOSITE CHANGES IN ELECT ROPHYSIOLOGICAL REACTIONS OF THE HUMAN BRAIN IN ADOPTING THE FREQUENCY OF LIGHT FLASHES AT VESTIBULAR AND OPTOKINETIC STIMULI,
AD-616 311 FLD. 6

•SANDER, R. C.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION,
AD-615 962 FLD. 9

•SANDERS, A. P.
• • •
SOME EFFECTS OF ANOXIA ON TISSUE METABOLISM,
AD-616 181 FLD. 6

•SANDERS, W. W. , JR.
• • •
EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 034 FLD. 13
• • •
FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 039 FLD. 13

•SANDY, FRANK
• • •
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
AD-615 930 FLD. 20

•SARTOR, J. D.
• • •
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES
AD-616 400 FLD. 1

•SARTOR, J. DOYNE
• • •
THE MUTUAL ATTRACTION OF CLOUD DROPLETS IN THE ELECT ROSTATIC FIELD OF THE ATMOSPHERE
AD-616 379 FLD. 4
• • •
DYNAMIC SIMILARITY AND THE MODELING OF CLOUD DROPLETS
AD-616 399 FLD. 8

•SARYCHEV, V. A.
• • •
ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE,
AD-615 860 FLD. 22

•SAVELEV, A. M.
• • •
ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION,
AD-615 876 FLD. 11

•SAWADA, T.
• • •
ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES,
AD-616 079 FLD. 20
• • •
EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS,
AD-616 080 FLD. 20

•SAXON, D. S.
• • •
ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES,
AD-616 079 FLD. 20
• • •
EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS,
AD-616 080 FLD. 20

•SAZONOVA, V. A.
• • •
ALPHA-FERROCENYLCARBONIUM SALTS,
AD-615 870 FLD. 7

•SCHAEFFER, B. B.
• • •
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-M-CARBORANYLENESILOXANES,
AD-615 819 FLD. 7

•SCHAMBERG, R.
• • •
ON THE FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES,
AD-616 423 FLD. 13

•SCHILLING, G. F.
• • •
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT,
AD-615 949 FLD. 3

•SCHMIDT, L. V.
• • •
MEASUREMENTS OF FLUCTUATING AIR LOADS ON A CIRCULAR CYLINDER,
AD-616 186 FLD. 1

•SCHMITT, F. H.
• • •
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
AD-616 330 FLD. 19

•SCHNITZER, HOWARD J.
• • •
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
AD-616 206 FLD. 20

•SCHREIBER, EDWARD
• • •
THE RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
AD-616 166 FLD. 8

•SCHREINER, H. R.
• • •
THE PHYSIOLOGICAL EFFECTS OF ARGON, HELIUM AND THE RARE GASES.
AD-615 819 FLD. 6

•SCHRODER, K.
• • •
CRACK INITIATION IN METALLIC MATERIALS.
AD-615 786 FLD. 11

•SCHUPP, J. E.
• • •
PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9

•SCHURZ, DANIEL R.
• • •
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

•SCHWIDERSKI, ERNST W.
• • •
ON THE BIRTH AND DECAY OF VORTICES,
AD-615 770 FLD. 20

•SCHWINGER, JULIAN
• • •
FIELD THEORY OF MATTER. II,
AD-616 182 FLD. 20

•SEAGONDOLLAR, L. W.
• • •
STRUCTURE OF LOW-MEDIUM MASS NUCLEI,
AD-616 242 FLD. 20

•SELLS, S. B.
• • •
THE SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE,
AD-615 762 FLD. 5
• • •
ECOLOGY AND THE SCIENCE OF PSYCHOLOGY.
AD-615 768 FLD. 5

•SHAFROTH, S. M.
• • •
ON THE SECOND 2 + LEVEL OF NI(58),
AD-616 199 FLD. 20

•SHAM, L. J.
• • •
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS,
AD-615 799 FLD. 20

•SHANNON, I. L.
• • •
REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE
AD-616 030 FLD. 6

•SHARAPOVA, T. A.
• • •
SPECTROSCOPIC INVESTIGATION OF THE STATE OF GAS BEHIND A DETONATION FRONT,
AD-615 984 FLD. 19

•SHAW, J. C.
• • •
JOSS: EXPERIENCE WITH AN EXPERIMENTAL COMPUTING SERVICE FOR USERS AT REMOTE TYPEWRITER CONSOLES,
AD-615 949 FLD. 9

•SHAW, T. M.
• • •
BAKEABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE,
AD-616 149 FLD. 14

•SHEAR, LEROY
• • •
PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN,
AD-616 137 FLD. 6

•SHELTON, P. L.
• • •
INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 256 FLD. 9

•SHEPARD, FRANCIS P.
• • •
DIVING SAUCER DESCENTS INTO SUBMARINE CANYONS,
AD-615 845 FLD. 8

•SHERBY, O. D.
• • •
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER
AD-615 926 FLD. 11
• • •
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES,
AD-615 927 FLD. 11

•SHERR, PAUL E.
• • •
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS,
AD-616 391 FLD. 4

•SHIELD, R.
• • •
MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 341 FLD. 20

•SHILLIDAY, T. S.
• • •
RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

•SHIN, ERNEST E. H.
• • •
UMKLAPP CONTRIBUTION TO BULK ABSORPTION IN SUPERCONDUCTORS,
AD-616 044 FLD. 20

•SHINABERGER, JAMES H.
• • •
PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN,
AD-616 137 FLD. 6

•SHIREN, N. S.
• • •
PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

•SHLIKHTER, E. B.
• • •
RADIATION POLYMERIZATION OF N-HEPTENE IN PRESENCE OF TICL4,
AD-615 983 FLD. 7

•SHTERN, M. A.
• • •
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE
AD-616 208 FLD. 11

•SHUMAKER, L. A.
• • •
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE.
AD-616 287 FLD. 8

•SICOTTE, R. C.
• • •
HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER
AD-616 132 FLD. 9

•SIENKO, M. J.
• • •
SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE,
AD-616 209 FLD. 20

•SIFOROV, V. I.
• • •
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES)
AD-616 130 FLD. 20

•SILVERMAN, S. M.
• • •
THE EQUATORIAL AIRGLOW
AD-616 299 FLD. 3

•SIMPSON, STEPHEN M. , JR.
• • •
MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094)
AD-616 294 FLD. 8

•SIMS, A. L.
• • •
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
AD-615 772 FLD. 4

•SINGLETON, ROBERT J.
• • •
THE DTMB MARK I MEASUREMENT SYSTEM FOR CABLE-TOWED BODIES
AD-615 767 FLD. 9

•SIRKIS, M. D.
• • •
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
AD-616 002 FLD. 20

•SITTLER, ROBERT W.
• • •
REAL TIME COMPUTATION OF CONSTRAINED LEAST SQUARES ESTIMATORS,
AD-616 390 FLD. 12

•SJOBLOM, J. J.
• • •
STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-615 907 FLD. 5

•SLADE, J. J.
• • •
CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
AD-616 068 FLD. 20

•SLIVA, PHILIP O.
• • •
OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX,
AD-616 184 FLD. 20

•SMITH, A. W. H.
• • •
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS,
AD-616 299 FLD. 9

•SMITH, ALEX G.
• • •
RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON,
AD-616 195 FLD. 3

•SMITH, DAVID C.
• • •
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
AD-616 109 FLD. 1

•SMITH, E. L.
• • •

EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS,
AD-616 170 FLD. 6

•SMITH, EDWARD B.
• • •
NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOP OIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST
AD-616 026 FLD. 6

•SMITH, FRANCIS J.
• • •
AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL,
AD-616 225 FLD. 20

•SMITH, R. A.
• • •
INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT,
AD-616 174 FLD. 20

•SMITH, R. V.
• • •
VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES,
AD-616 179 FLD. 4

•SNIDER, D.
• • •
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

•SNOWDEN, KENNETH U.
• • •
DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION.
AD-616 352 FLD. 11

•SOHLBERG, ERIK T.
• • •
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW,
AD-615 996 FLD. 13

•SOKOLOFF, J.
• • •
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

•SOLIMENE, N.
• • •
THEORETICAL RESEARCH ON LASER OSCILLATION.
AD-615 804 FLD. 20

•SOLOUKHIN, R. I.
• • •
SPECTROSCOPIC INVESTIGATION OF THE STATE OF GAS BEHIND A DETONATION FRONT,
AD-615 984 FLD. 19
• • •
PULSATING COMBUSTION OF GAS BEHIND A SHOCK WAVE IN SUPERSONIC FLOW,
AD-615 985 FLD. 21

•SORENSON, JOHN L.
• • •
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY
AD-615 910 FLD. 5

•SOWERS, HARRY D.
• • •
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVIATION OF LIFT FAN NOISE.
AD-616 267 FLD. 1

•SPEARS, M. F.
• • •
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

•SPRINZ, HELMUTH
• • •
A KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE,
AD-616 139 FLD. 6

•SRINIVASAN, T. M.
• • •
X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR,
AD-616 036 FLD. 20

•SRIVASTAVA, R. C.
• • •
TWO STUDIES OF CONVECTION. A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION. HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS,
AD-616 094 FLD. 4

•STAUDER, WILLIAM
• • •
APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
AD-615 841 FLD. 8

•STEELE, WILLIAM A.
• • •
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. I. X RAYS AND NEUTRONS,
AD-616 189 FLD. 20
• • •
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. II. LIGHT,
AD-616 190 FLD. 20

•STEINGASZNER, LASZLO C.
• • •
HEMANGIOSARCOMA OF THE BREAST,
AD-616 027 FLD. 6

•STENNETT, E. A.
• • •
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER.
AD-615 811 FLD. 9

•STEORTS, R. C.
• • •
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS.
AD-616 240 FLD. 9

•STEPHEN, M. J.
• • •
VISCOSITY OF TYPE-II SUPERCONDUCTORS,
AD-616 090 FLD. 20

•STEVENSON, D. M.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION
AD-616 001 FLD. 9

•STOCKHAUSEN, J. H.
• • •
ENERGY PER UNIT-AREA SPECTRUM OF THE SHOCK WAVE FROM 1-LB TNT CHARGES EXPLODED UNDERWATER,
AD-616 154 FLD. 19

•STOLLER, DAVID S.
• • •
MEASURING MISSILE RELIABILITY IN PRE-LAUNCH ENVIRONMENTS,
AD-616 383 FLD. 16

•STOLUROW, LAWRENCE M.
• • •
ESSENTIAL PRINCIPLES OF PROGRAMED INSTRUCTION,
AD-616 296 FLD. 5

•STONE, D. L.
• • •
10 KC/S ATMOSPHERIC NOISE PREDICTIONS,
AD-615 923 FLD. 4

•STOUT, G. E.
• • •
INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS,
AD-615 772 FLD. 4

•STOWELL, ROBERT E.
• • •
STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTER ATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
AD-616 029 FLD. 6
• • •
EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES
AD-616 226 FLD. 6

•STOYANOV, P. A.
• • •
MAGNETOSTATIC PRISM FOR ADJUSTING OF ELECTRON MICROSCOPE
AD-615 866 FLD. 14

•STRANDBERG, M. W. P.
• • •
ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE,
AD-616 092 FLD. 20

•STRONG, S. L.
• • •
LOCAL ORDER IN LIQUID ALLOYS,
AD-616 277 FLD. 11

•STUDNEV, R. V.
• • •
CERTAIN PROBLEMS OF OPTIMUM CONTROL OF THREE DIMENSIONAL MOTION OF SPACE VEHICLES,
AD-615 894 FLD. 22

•SUDARSHAN, E. C. G.
• • •
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
AD-616 206 FLD. 20

•SUN, C.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION,
AD-615 962 FLD. 9

•SUN, S. C.
• • •
A VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962,
AD-615 851 FLD. 6

•SUNDERLAND, J. EDWARD
• • •
INVESTIGATION INTO THE MECHANISM OF FREEZE DRYING.
AD-615 890 FLD. 6

•SUTTON, WILLARD H.
• • •
INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-615 817 FLD. 11

•SWAKON, E. A.
• • •
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•SWEEDLER, A. R.
• • •
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 055 FLD. 20

•SWERLING, P.
• • •
NOTE ON A NEW COMPUTATIONAL DATA SMOOTHING PROCEDURE SUGGESTED BY MINIMUM MEAN SQUARE ERROR ESTIMATION,
AD-615 935 FLD. 14

•SWERLING, PETER
• • •
THE RESOLVABILITY OF POINT SOURCES,
AD-616 420 FLD. 17

•SYKES, LYNN R.
• • •
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS,
AD-615 833 FLD. 8

•TALIBI, M. A.
• • •
INVESTIGATING THE EFFECT OF GAMMA-RAYS, X-RAYS AND NEUTRONS ON ELECTRIC PROPERTIES OF CDS-SE AND CDSE-SE RECTIFYING SYSTEMS,
AD-615 868 FLD. 9

•TALMADGE, M. G. , JR.
• • •
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS.
AD-616 117 FLD. 9

•TAVIRA, P.
• • •
A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION (ESTUDIO TOPOGRAFICO DE LAS IMPERFECCIONES DE UN CRISTAL POR DIFRACCION DE RAYOS X: METODO DEL HAZ PARALELO),
AD-616 061 FLD. 20

•TAYLOR, HERBERT B.
• • •
HEMANGIOSARCOMA OF THE BREAST,
AD-616 027 FLD. 6

•TEDNON, C. S. , JR.
• • •
RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM,
AD-616 020 FLD. 20

•TELEGDI, V. L.
• • •
EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 023 FLD. 20

•TESTROET, FRANK B.
• • •
EVALUATION OF ETHYLENE PROPYLENE TERPOLYMER ELASTOMERS
AD-616 922 FLD. 11

•TEVEBAUGH, A. D.
• • •
SATURATED HYDROCARBON FUEL CELL PROGRAM.
AD-615 889 FLD. 10

•THOMAS, JOHN R.
• • •
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW,
AD-616 417 FLD. 5

•THOMPSON, D. S.
• • •
ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA,
AD-615 847 FLD. 5

•THOMPSON, ROBERT I. , JR.
• • •
AN INVESTIGATION OF EDP APPLICATIONS IN USAF HOSPITALS.
AD-616 362 FLD. 6

•THOMSON, KER C.
• • •
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 4485,
AD-616 391 FLD. 11

•THRALL, G. P.
• • •
SEISMIC PARTIAL COHERENCY STUDY.
AD-616 259 FLD. 17

•THYREGOD, P.
• • •
THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPEC TION BY ATTRIBUTES,
AD-615 797 FLD. 12

•TINKLEPAUGH, J. R.
• • •
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•TISDELL, C.
• • •
UPON THE PARETO OPTIMALITY OF GROUP BEHAVIOR.
AD-616 290 FLD. 9

•TODD, JAMES P.
• • •
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS,
AD-616 396 FLD. 11

•TOKAREV, V. V.
• • •
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER,
AD-615 862 FLD. 17

•TOMBOULIAN, R.
• • •
ELECTROMAGNETIC STUDIES IN SHOCK PRODUCED PLASMAS.
AD-616 272 FLD. 20

•TOMLINSON, W. R. , JR.
• • •
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES
AD-615 895 FLD. 19

•TOTH, I. J.
• • •
USE OF REACTIVE ATMOSPHERES FOR THE TREATMENT OF B. C. C. METALS.
AD-616 273 FLD. 13

•TOWLE, LAIRD C.
• • •
THE SHEAR STRENGTHS OF SOME SOLIDIFIED GASES.
AD-616 071 FLD. 7

•TOWNSEND, JONATHAN
• • •
DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM,
AD-616 218 FLD. 20
• • •
GATED INTEGRATOR FOR REPETITIVE SIGNALS,
AD-616 222 FLD. 14

•TRAYNOR, JOSEPH EDWARD
• • •
MEGAKARYOCYTE AND PLATELET PRODUCTION IN NORMAL DOGS AND DOGS SUBJECTED TO THREE TYPES OF MARROW STRESS.
AD-616 393 FLD. 6

•TREIMAN, S. B.
• • •
IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS
AD-616 047 FLD. 20

•TROUT, D. L.
• • •
BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS,
AD-616 159 FLD. 6

•TRUMP, BENJAMIN F.
• • •
STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTER ATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
AD-616 029 FLD. 6
• • •
EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES
AD-616 226 FLD. 6

•TSAO, CARSON K. H.
• • •
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA,
AD-615 789 FLD. 20
• • •
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN,
AD-615 794 FLD. 20

•TUCKER, SIDNEY G.
• • •
ANCHOR SYSTEMS FOR PREFAB RICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964,
AD-616 249 FLD. 1

•TULEY, F. H.
• • •
CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE,
AD-616 263 FLD. 11

•TURNER, MARGARET A.
• • •
THE EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL

COMPONENT,
AD-616 187 FLD. 7

•TYLER, C. H.
• • •
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT,
AD-615 893 FLD. 1

•UDIAS, AGUSTIN
• • •
A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETER MINATION USING S-WAVE DATA
AD-615 840 FLD. 8
• • •
APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
AD-615 841 FLD. 8

•VADNAIS, RAYMOND R. , JR.
• • •
QUANTITATIVE TERRAIN FACTORS AS RELATED TO SOIL PARENT MATERIALS AND THEIR ENGINEERING CLASSIFICATION.
AD-616 363 FLD. 8

•VARGA, RICHARD S.
• • •
DISCRETIZATION ERRORS FOR WELL-SET CAUCHY PROBLEMS.I.
AD-616 017 FLD. 12

•VASILEVA, V. M.
• • •
CHANGES IN THE ELECTROENC EPHALOGRAM AND DERMA-GALVANIC REACTIONS IN THE PROCESS OF FORMATION OF TENTATIVE RELATIONSHIP BETWEEN MOTORIAL AND VISUAL ANALYZERS IN HUMANS,
AD-615 995 FLD. 5

•VERNOV, S.
• • •
LABORATORIES IN SPACE
AD-615 986 FLD. 22

•VESPER, WILLIAM H.
• • •
BEHAVIOR OF BEACH FILL AND BORROW AREA AT SEASIDE PARK, BRIDGEPORT, CONNECTICUT
AD-615 791 FLD. 13

•VESTINE, E. H.
• • •
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES
AD-616 384 FLD. 4
• • •
THE UPPER ATMOSPHERE AND GEOMAGNETISM,
AD-616 409 FLD. 4
• • •
MAXIMUM TOTAL ENERGY OF THE VAN ALLEN RADIATION BELT,
AD-616 418 FLD. 8
• • •
THE SURVEY OF THE GEOMAGNETIC FIELD IN SPACE,
AD-616 421 FLD. 8

•VETTER, WALTER
• • •
THE STRUCTURE OF PHYLLALBINE. APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVA TIVES,
AD-616 337 FLD. 7

•VICKROY, V. V.
• • •
MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS.
AD-616 097 FLD. 11

•VICTOR, G. A.
• • •
THEORETICAL STUDIES OF HEAVY ION EXCHANGE IN AIR.
AD-616 103 FLD. 4

•VIENNA, P. C.
• • •
DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•VIGROUX, E.
• • •
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE! REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 250 FLD. 3
• • •
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958,
AD-616 252 FLD. 3

•VOLMIR, A. S.
• • •
STUDYING THE BEHAVIOR OF SHELLS AND PLATES UPON IMPACT,
AD-615 871 FLD. 20

•VON DOHARUS, EILHARD
• • •
THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY
AD-616 334 FLD. 5

•VON GUTFELD, R. J.
• • •
PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

•VRATSANOS, SPYROS M.
• • •
POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•VVEDENSKII, B. A.
• • •
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES)
AD-616 130 FLD. 20

•WAARAMAA, JACKIE B.
• • •
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

•WADDINGTON, C. J.
• • •
ELECTRONS, HYDROGEN AND HELIUM NUCLEI OBSERVED IN THE PRIMARY COSMIC RADIATION DURING 1963,
AD-616 297 FLD. 18

•WAGNER, LINDEN H.
• • •
CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS,
AD-615 941 FLD. 11

•WAGNER, ROSEMARIE A.
• • •
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

•WAIDMANN, GUNTER
• • •
THE VELOCITY OF STREAMER TIPS IN IMPULSE POINT-TO-PLANE CORONA IN AIR, USING LICHTENBERG FIGURE TECHNIQUES
AD-616 076 FLD. 20

•WAKNIS, MRUDULLA N.
• • •
A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL,
AD-615 848 FLD. 12

•WALDER, J.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION,
AD-615 939 FLD. 9

•WALDRON, HOWARD L.
• • •
PENETRATION OF PROJECTILES INTO FROZEN GROUND,
AD-616 348 FLD. 19

•WALLER, BENJAMIN EDWARD , III.
• • •
THE COLOR PROBLEM.
AD-616 382 FLD. 8

•WALLIS, GEORGE
• • •
INVESTIGATION F ULTR HIGH VACUUM SPUTTERED THIN FILMS,
AD-615 971 FLD. 20

•WALLS, J. C.
• • •
FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 035 FLD. 13

•WALSH, DON
• • •
THE BATHYSCAPH TRIESTE TECHNOLOGICAL AND OPERATIONAL ASPECTS, 1958-1961,
AD-616 288 FLD. 8

•WALTHER, H. F.
• • •
PROPOSED FILTERED SHIELDED CONNECTOR FOR PROTECTION OF WEAPONS FROM ELECTROMAGNETIC RADIATION.
AD-616 309 FLD. 19

•WANG, S. C.
• • •
INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION,
AD-615 939 FLD. 9

•WARD, J.
• • •
MANNED CONTROL OF ORBITAL RENDEZVOUS,
AD-616 402 FLD. 22

•WARD, J. C.
• • •
ELECTROMAGNETIC AND WEAK INTERACTIONS,
AD-616 050 FLD. 20
• • •
GAUGE THEORY OF ELEMENTARY INTERACTIONS,
AD-616 099 FLD. 20

•WARD, R. A.
• • •
STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER,

AD-616 072 FLD. 6

•WARD, S. H.

• • •

A CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD,
AD-616 259 FLD. 8

•WARSHAW, M.

• • •

TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(R;N,P) FOR LARGE N AND SMALL P,
AD-616 370 FLD. 12

•WATSON, K. M.

• • •

LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY,
AD-616 048 FLD. 18

•WAUGH, J. S.

• • •

ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA,
AD-615 847 FLD. 5

•WAX, NELSON

• • •

ON A PHASE METHOD FOR TREATING STURMLIOUVILLE EQUATIONS AND PROBLEMS,
AD-616 373 FLD. 12

•WEBB, T. G.

• • •

THEORETICAL STUDIES OF HEAVY ION EXCHANGE IN AIR.
AD-616 103 FLD. 4

•WEBSTER, ROGER R.

• • •

LOW-NOISE L-BAND AMPLIFIER.
AD-616 331 FLD. 9

•WECHSLER, A. E.

• • •

CHARACTERISTICS OF METAL VAPORS.
AD-616 110 FLD. 20

•WEHNER, D. R.

• • •

INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 356 FLD. 9

•WEINBERG, STEVEN

• • •

EVIDENCE THAT THE DEUTERON IS NOT AN ELEMENTARY PARTICLE
AD-616 214 FLD. 20

•WEINER, J. H.

• • •

DISLOCATION VELOCITIES IN A LINEAR CHAIN,
AD-616 219 FLD. 20

•WEISS, V.

• • •

CRACK INITIATION IN METALLIC MATERIALS.
AD-615 786 FLD. 11

•WEISSMANN, S.

• • •

CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
AD-616 068 FLD. 20

•WEXLER, RAYMOND

• • •

OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS.
AD-616 351 FLD. 4

•WHITE, J. L.

• • •

CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH APPLICATION TO RAPID EXTERNAL FLOWS.
AD-616 083 FLD. 20

•WHITE, LEON S.

• • •

THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
AD-616 111 FLD. 13

•WHITFIELD, A. A.

• • •

UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION,
AD-616 104 FLD. 1

•WHITNEY, H. E.

• • •

IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

•WICKLUND, J. S.

• • •

AN EASY WAY TO DETERMINE THE SHAPE OF A DRIVING FUNCTION FROM THE RESPONSE OF A LINEAR SYSTEM,
AD-616 126 FLD. 14

•WILHELM, H. E.

• • •

MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMADYNAMIC POWER GENERATORS,
AD-616 260 FLD. 9

•WILKINS, J. W.

• • •

LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS
AD-616 088 FLD. 20

•WILKOV, M. A.

• • •

CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE.
AD-616 269 FLD. 11

• • •

A NEW METHOD FOR THE PREPARATION OF SUCCESSIVE REPLICAS FOR USE IN ELECTRON MICROSCOPY,
AD-616 340 FLD. 14

• • •

MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 341 FLD. 20

•WILLIAMS, KINGSLEY G.

• • •

A REFRACTIVE TECHNIQUE FOR MEASUREMENT OF WATER WAVE SLOPE,
AD-616 303 FLD. 8

•WILLIAMS, M. L.

• • •

THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS,
AD-616 344 FLD. 11

•WILLIAMS, ROBERT E.

• • •

A SIX-BORON CARBORANE (CH3)2C2B6H6 AND B6H10:P (C6H5)3 FROM HEXABORANE-10,
AD-615 959 FLD. 7

•WILLIAMSON, S. J.

• • •

INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT,
AD-616 174 FLD. 20

•WILLIAMSON, SAMUEL J.

• • •

ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINDKY-MORIYA COUPLING; ORIENTATION DEPENDENCE IN ALPHA-FE203
AD-616 173 FLD. 20

•WILSON, A. G.

• • •

A SCIENTIST'S NOTES ON THE COLD WAR,
AD-616 365 FLD. 15

•WILSON, RAYMOND B. , JR.

• • •

RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS.
AD-615 912 FLD. 14

•WING, G. MILTON

• • •

INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

• • •

INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY, V: DIFFUSION AS A LIMITING CASE,
AD-616 403 FLD. 20

•WINN, W. P.

• • •

A MODEL FOR STREAMER PROPAGATION,
AD-616 078 FLD. 20

•WITSENHAUSEN, H. S.

• • •

SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS,
AD-616 301 FLD. 12

•WOLAVER, LYNN E.

• • •

SECOND ORDER PROPERTIES OF NONLINEAR SYSTEMS DRIVEN BY RANDOM NOISE,
AD-615 821 FLD. 12

•WOLD, A.

• • •

MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS
AD-616 041 FLD. 8

•WOLF, E.

• • •

TEMPORAL COHERENCE OF BLACK BODY RADIATION,
AD-616 223 FLD. 20

•WOLFE, C. M.

• • •

JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
AD-616 002 FLD. 20

•WOLLRAB, JAMES E.

• • •

AN IMPROVED STRUCTURE FOR TRIMETHYLAMINE,
AD-615 829 FLD. 7

•WOO, CHIA-WEI

• • •

MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS
AD-616 219 FLD. 20

•WOOD, G. T.

• • •

INTERNAL FIELD, EXCHANGE

FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM IRON GARNET,
AD-616 229 FLD. 20

• • •

ON THE SECOND 2 + LEVEL OF NI(98),
AD-616 199 FLD. 20

•WOOD, L. R.

• • •

RESEARCH ON AMMONIA BATTERY SYSTEM.
AD-615 973 FLD. 10

•WOODBURY, H. H.

• • •

NEW SOLID-STATE DEVICE CONCEPTS,
AD-616 250 FLD. 20

•WOODS, G. FORREST

• • •

AN INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3,5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

•WOODS, H. P.

• • •

APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET.
AD-616 230 FLD. 20

•WOODWARD, KENNETH E.

• • •

THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION
AD-616 134 FLD. 6

•WOOLRIDGE, ROBERT L.

• • •

REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964,
AD-616 014 FLD. 6

•WRIGHT, J. C.

• • •

HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
AD-616 188 FLD. 7

•WU, YAU

• • •

THEORIES OF THERMAL TRANS PIRATION AND MOLECULAR EFFUSION
AD-616 285 FLD. 1

•WUERER, J. E.

• • •

FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART,
AD-616 236 FLD. 1

•WULFF, J.

• • •

RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM,
AD-616 020 FLD. 20

•WYKES, A. A.

• • •

THE EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMINES AS INFLUENCED BY PARGYLINE HYDROCHLORIDE AND IPRONIAZID PHOSPHATE,
AD-616 158 FLD. 6

•YANKURA, G. A.

• • •

TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

•YAROSHEVSKII, V. A.

• • •

PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL,
AD-615 859 FLD. 22

•YEARIAN, M. R.

• • •

ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11,
AD-616 193 FLD. 20

•YEH, K. C.

• • •

SOVIET AND COMMUNIST CHINESE INDUSTRIALIZATION STRATEGIES,
AD-615 992 FLD. 5

•YOKOYAMA, MITSUO

• • •

IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID,
AD-616 228 FLD. 6

•YOULA, D. C.

• • •

TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLI CATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS
AD-616 266 FLD. 9

•YOUNG, DOUGLAS E.

• • •

STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTER ATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
AD-616 024 FLD. 6

• • •

EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES
AD-616 226 FLD. 6

•ZAJONC, ROBERT B.

• • •

INDIVIDUAL TASK PERFORMANCE IN A CHANGING SOCIAL STRUCTURE
AD-616 233 FLD. 5

•ZAVARITSKII, N. V.

• • •

THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPERATURES,
AD-616 338 FLD. 20

•ZENGEL, ALAN E.

• • •

A COMPARISON OF THE CAPAB ILITIES OF A FUEL COKER AND THE HINEX HEAT EXCHANGER FOR DETERMINING HYDROCARBON FUEL THERMAL STABILITY.
AD-616 361 FLD. 21

•ZHUBAEV, N.

• • •

STUDYING SHOCK WAVE PROPA GATION IN THE SOIL,
AD-615 867 FLD. 8

•ZHUKOV, M. YU.

• • •

LOW-TEMPERATURE PLASMA GENERATORS,
AD-616 310 FLD. 20

•ZWICKER, U.

• • •

SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM,
AD-616 089 FLD. 11

CORPORATE AUTHOR - MONITORING AGENCY INDEX

The fields indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

•ADVANCED RESEARCH PROJECTS AGENCY WASHINGTON D C

VUF-1001
GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS OF THE SAND SPRINGS RANGE, FAIRVIEW VALLEY, AND FOURMILE FLAT, CHURCHILL COUNTY, NEVADA.
AD-615 793 FLD. 14

•AEROELASTIC AND STRUCTURES RESEARCH LAB MASS INST OF TECH CAMBRIDGE

ASRL TR 112 3
THE FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
(AFOSR 65-0639)
AD-616 321 FLD. 1

ASRL TR 117 1
AN EXPERIMENTAL INVESTIGATION OF ROTOR HARMONIC AIRLOADS INCLUDING THE EFFECTS OF ROTOR-ROTOR INTERFERENCE AND BLADE FLEXIBILITY.
(USAAML TR-65-13)
AD-615 922 FLD. 1

•AEROJET-GENERAL CORP SACRAMENTO CALIF

7439 Q 3
HYDROSTATIC BEARING FEASIBILITY PROGRAM.
(AFRPL TR-65-97)
AD-616 284 FLD. 13

•AEROPHYSICS LAB MASS INST OF TECH CAMBRIDGE

HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK: PHASE II
(ARL 64-214)
AD-615 904 FLD. 1

•AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

TR 64 139
EXPERIMENTAL DETERMINATION OF THE MAXIMUM SAFE THERMAL RADIATION LOADS FOR A FIGHTER-BOMBER COCKPIT.
AD-615 812 FLD. 1

TR 65 6
EFFECT OF AUGMENTED TELEVISION DEPTH CUES ON THE TERMINAL PHASE OF REMOTE DRIVING.
AD-615 929 FLD. 6

•AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO

ARL 65 13
VARIABLE CONDUCTIVITY MFD COUETTE FLOW.
AD-616 354 FLD. 20

ARL 65 61
SECOND ORDER PROPERTIES OF NONLINEAR SYSTEMS DRIVEN BY RANDOM NOISE.
AD-615 821 FLD. 12

64-214
HYPERSONIC FLOW FIELD ABOUT A BLUNT NOSED CONE AT ANGLE OF ATTACK: PHASE II
AD-615 904 FLD. 1

65-11
DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION.
AD-616 352 FLD. 11

65-15
NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
AD-615 901 FLD. 1

65-18
RECENT RESULTS IN THEORETICAL AND EXPERIMENTAL HYPERSONICS AND THEORETICAL MAGNETOHYDRODYNAMICS.
AD-615 923 FLD. 1

65-46
METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS.
AD-616 345 FLD. 13

65-48
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
AD-616 353 FLD. 20

65-53
CHARACTERISTICS OF METAL VAPORS.
AD-616 110 FLD. 20

65-55
AN INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3,5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
AD-615 900 FLD. 7

65-58
A DIGITAL COMPUTER PROGRAM FOR CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS.
AD-615 902 FLD. 1

65-63
STRUCTURE OF LOW-MEDIUM MASS NUCLEI.
AD-616 242 FLD. 20

65-67
LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER.
AD-616 109 FLD. 1

65-68
PERFORMANCE CHARACTERISTICS OF A FULLY DEVELOPED CONSTRICTED TRANSPIRATION-COOLED ARC.
AD-615 903 FLD. 20

65-72
UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION.
AD-616 102 FLD. 1

•AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C

FOREIGN SCIENCE BULLETIN, VOL. 1, NO. 6, 1965.
(TT 65-62403)
AD-615 879 FLD. 5

•AIR FORCE AERO PROPULSION LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO

APL TR 64 184
A COMPARISON OF THE CAPABILITIES OF A FUEL COKER AND THE MINEX HEAT EXCHANGER FOR DETERMINING HYDROCARBON FUEL THERMAL STABILITY.
AD-616 361 FLD. 21

TR-65-10
INVESTIGATION OF THE FEASIBILITY OF SYNERGISTIC ENHANCEMENT OF HALOGENATED FIRE EXTINGUISHANTS.
AD-616 101 FLD. 11

•AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS

AFCRL 65 231
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY-BIPHENYL.
AD-615 968 FLD. 13

AFCRL 65 236
STRATOSPHERIC ENERGY PROCESSES AND ASSOCIATED ATMOSPHERIC LONG-WAVE STRUCTURE IN WINTER.
AD-616 129 FLD. 4

AFCRL 65 266
GEOLOGY, MINERALOGY, AND HYDROLOGY OF U. S. PLAYAS.
AD-616 243 FLD. 8

AFCRL 65 279
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
AD-616 296 FLD. 20

AFCRL 65 280
THE EQUATORIAL AIRGLOW
AD-616 244 FLD. 3

AFCRL 65 286
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

AFCRL 65 287
THE EVOLUTION OF AN IONOSPHERIC HOLE.
AD-615 969 FLD. 4

AFCRL 65 317
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

AFCRL 65 321
ON THE THEORY OF BOOLEAN FORMULAS: SUBFORMULAS AND SUBSTITUTION OPERATORS.
AD-616 122 FLD. 12

AFCRL 65 329
ON THE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN.
AD-616 121 FLD. 19

AFSG 162
THE EQUATORIAL AIRGLOW
AD-616 244 FLD. 3

ERP 101
THE EVOLUTION OF AN IONOSPHERIC HOLE.
AD-615 969 FLD. 4

ERP 102
IONOSPHERIC ELECTRON CONTENT MEASUREMENTS DURING A SOLAR ECLIPSE.
AD-616 140 FLD. 4

ERP 98
STRATOSPHERIC ENERGY PROCESSES AND ASSOCIATED ATMOSPHERIC LONG-WAVE STRUCTURE IN WINTER.
AD-616 129 FLD. 4

• • •

ERP 96
GEOLOGY, MINERALOGY, AND HYDROLOGY OF U. S. PLAYAS.
AD-616 243 FLD. 8

• • •

PMSRP 103
ON THE THEORY OF BOOLEAN FORMULAS: SUBFORMULAS AND SUBSTITUTION OPERATORS.
AD-616 122 FLD. 12

• • •

PSRP 105 AFCRL 65 323
ELECTROMAGNETIC PROPERTIES OF A PLASMACOVERED ANTENNA.
AD-616 123 FLD. 9

• • •

PSRP 106
ON THE IMPEDANCE METHOD FOR MEASURING HIGH ELECTRON DENSITY AND ELECTRON COLLISION FREQUENCY IN A GASEOUS PLASMA COLUMN.
AD-616 121 FLD. 14

• • •

PSRP 95
EXPERIMENTAL STUDY OF ZONE REFINING OF THE BINARY SYSTEM TRIPHENYL ANTIMONY-BIPHENYL.
AD-615 968 FLD. 13

• • •

PSRP 98
GUIDE TO THE INTERPRETATION OF SPACE GROUP SYMBOLS.
AD-616 246 FLD. 20

• • •

PSRP 99
CALCULATED CROSS SECTIONS FOR ATOMIC DISPLACEMENTS PRODUCED BY ELECTRONS IN THE 1.03-3.0 MEV ENERGY RANGE.
AD-616 245 FLD. 18

• • •

63-634
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
AD-616 349 FLD. 4

• • •

64-683
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA.
AD-616 386 FLD. 4

• • •

64-806 ADD
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
AD-616 320 FLD. 4

• • •

64-869
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
AD-616 347 FLD. 4

• • •

64-88 B
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE. REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 251 FLD. 3

• • •

64-88-A
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: REDUCTION OF THE AROSA OBSERVATIONS.
AD-616 250 FLD. 3

• • •

64-88-C
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958,
AD-616 252 FLD. 3

• • •

65-10
TWO STUDIES OF CONVECTION. A MODEL OF CONVECTION WITH ENTRAINMENT AND PRECIPITATION.
HIGH RADAR ECHOES FROM ALBERTA THUNDERSTORMS,
AD-616 094 FLD. 4

• • •

65-118
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION
AD-615 972 FLD. 4

• • •

65-142
TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE.
AD-615 838 FLD. 8

• • •

65-143
CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE VELOCITY INVERSION,
AD-615 839 FLD. 8

• • •

65-144
A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETERMINATION USING S-WAVE DATA
AD-615 840 FLD. 8

• • •

65-145
APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
AD-615 841 FLD. 8

• • •

65-146
AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES,
AD-615 842 FLD. 8

• • •

65-147
SEISMIC WAVES WITH FREQUENCIES FROM 1 TO 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY,
AD-615 834 FLD. 8

• • •

65-148
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS,
AD-615 833 FLD. 8

• • •

65-153
(1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS,
AD-616 008 FLD. 4

• • •

65-159
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
AD-615 980 FLD. 17

• • •

65-161
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY,
AD-615 827 FLD. 9

• • •

65-183
THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964,
AD-615 764 FLD. 20

• • •

65-187
SOME ASPECTS OF THE MIDDLE STRATOSPHERE.
AD-616 253 FLD. 4

• • •

65-189
IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
AD-616 107 FLD. 4

• • •

65-191
INTRODUCTION TO THE STUDY OF AERONOMIC COLLISIONS,
AD-615 970 FLD. 4

• • •

65-193
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS.
AD-616 351 FLD. 4

• • •

65-196
RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS.
AD-615 912 FLD. 14

• • •

65-211
DISTRIBUTIONS AND CHARACTERISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
AD-616 295 FLD. 4

• • •

65-243
A STOCHASTIC MODEL FOR THE EVOLUTION OF CLOUD COVER, ESTIMATION OF PARAMETERS AND GOODNESS OF FIT BASED ON BOSTON DATA.
AD-616 394 FLD. 4

• • •

65-249
THE GYRATION OPERATOR IN NETWORK THEORY,
AD-616 329 FLD. 9

• • •

65-25
ATMOSPHERIC DENSITY DETERMINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
AD-615 924 FLD. 4

• • •

65-250
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
AD-615 930 FLD. 20

• • •

65-270
THEORETICAL RESEARCH ON LASER OSCILLATION.
AD-615 809 FLD. 20

• • •

65-271
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
AD-616 002 FLD. 20

• • •

65-29
PSEUDO-RANDOM DOT SCAN TELEVISION SYSTEMS.
AD-616 279 FLD. 17

• • •

65-291
CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
AD-616 335 FLD. 7

• • •

65-293
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
AD-615 780 FLD. 20

• • •

65-296
NEW SOLID-STATE DEVICE CONCEPTS,
AD-616 350 FLD. 20

• • •

65-298
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN.
AD-615 794 FLD. 20

• • •

65-299
RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA.
AD-615 785 FLD. 20

• • •

65-306

MAGNETIC TAPE COPIES OF MIT GEOPHYSICS PROGRAM SET II (TIME SERIES PROGRAMS FOR THE IBM 709, 7090, 7094)
AD-616 254 FLD. 8

• • •

65-215
RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
AD-616 099 FLD. 20

• • •

65-24
HYDROGEN-BROMINE FUEL CELL.
AD-616 108 FLD. 10

• • •

65-241
TOWER FOR MULTIPLATE ANTENNA.
AD-615 784 FLD. 13

• • •

65-245
INVESTIGATION F ULTR HIGH VACUUM SPUTTERED THIN FILMS,
AD-615 971 FLD. 20

• • •

65-258
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 9485,
AD-616 291 FLD. 11

• • •

65-83 I
DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
AD-616 398 FLD. 8

• • •

65-83 II
PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA: FURTHER RESULTS.
AD-616 397 FLD. 8

•AIR FORCE FLIGHT DYNAMICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB

• • •

TDR-64-64
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
AD-616 230 FLD. 19

•AIR FORCE MATERIALS LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO

• • •

ML
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
AD-615 966 FLD. 7

• • •

TDR-64-19 P2
MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS.
AD-616 097 FLD. 11

• • •

TDR-64-293
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS,
AD-616 246 FLD. 11

• • •

TR 64 377
ULTRACENTRIFUGATION AT VARIABLE ANGULAR VELOCITY-DERIVATION OF BASIC EQUATIONS.
AD-615 966 FLD. 7

• • •

TR-64-397
FATIGUE FAILURE OF SURFACE FILMS.
AD-616 291 FLD. 20

•AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C

• • •

J508
TEMPORAL COHERENCE OF BLACK BODY RADIATION,
AD-616 223 FLD. 20

• • •

3922:10
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. I. X RAYS AND NEUTRONS,
AD-616 189 FLD. 20

• • •

64-1952
STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART I. EXPERIMENTAL INVESTIGATION,
AD-615 798 FLD. 21

• • •

65-0368
THERMODYNAMICS OF MATERIALS WITH MEMORY,
AD-616 039 FLD. 20

• • •

65-0465
FIELD THEORY OF MATTER. II,
AD-616 182 FLD. 20

• • •

65-0466
BOUNDS ON PROPAGATORS, COUPLING CONSTANTS, AND VERTEX FUNCTIONS,
AD-616 183 FLD. 20

• • •

65-0593
BASIC PARAMETERS OF RETRIEVAL TESTS,
AD-616 175 FLD. 5

• • •

65-0639
THE FLUTTER OF AN INFINITELY LONG CYLINDRICAL SHELL.
AD-616 321 FLD. 1

• • •

65-0645
THEORIES OF THERMAL TRANS PIRATION AND MOLECULAR EFFUSION
AD-616 285 FLD. 1

• • •

65-0686
THE EFFECT OF STRUCTURE ON ACID-INDUCED DEOXYMERCURATION RATES. VARIATION IN THE ALCOHOL COMPONENT,
AD-616 187 FLD. 7

• • •

65-0691
HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
AD-616 188 FLD. 7

• • •

65-0730
QUANTUM THEORY OF ELECTRON GAS PLASMA OSCILLATIONS IN A MAGNETIC FIELD,
AD-616 042 FLD. 20

• • •

65-0735
UMKLAPP CONTRIBUTION TO BULK ABSORPTION IN SUPERCON DUCTORS,
AD-616 044 FLD. 20

• • •

65-0736
INFLUENCE OF LANDAU LEVEL BROADENING ON THE DE HAAS-VAN ALPHEN EFFECT,
AD-616 174 FLD. 20

• • •

65-0737
ANTIFERROMAGNETIC RESONANCE IN SYSTEMS WITH DZYALOSHINDKY-MORIYA COUPLING: ORIENTATION DEPENDENCE IN ALPHA-FE203
AD-616 173 FLD. 20

• • •

65-0743
A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION (ESTUDIO TOPOGRAFICO DE LAS IMPERFECCIONES DE UN CRISTAL POR DIFRACCION DE RAYOS X: METODO DEL HAZ PARALELO),
AD-616 061 FLD. 20

• • •

65-0765
MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES
AD-616 038 FLD. 20

• • •

65-0767
X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR,
AD-616 036 FLD. 20

• • •

65-0768
GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS,
AD-616 045 FLD. 11

• • •

65-0769
ENERGY OF GRAIN BOUNDARIES IN HALITE.
AD-616 049 FLD. 11

• • •

65-0772
SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH 1129,
AD-616 037 FLD. 20

• • •

65-0775
VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
AD-616 057 FLD. 20

• • •

65-0779
LOCALIZED LATTICE VIBRATION MODES DUE TO SUBSTITUTIONAL MASS DEFECTS IN SODIUM IODIDE
AD-616 058 FLD. 20

• • •

65-0782
THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION
AD-616 202 FLD. 20

• • •

65-0783
DISLOCATION VELOCITIES IN A LINEAR CHAIN,
AD-616 219 FLD. 20

• • •

65-0784
STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM,
AD-616 203 FLD. 20

• • •

65-0785
SOLID SOLUTION AND PRECIP ITATION HARDENING IN MG-FE-O ALLOYS,
AD-616 046 FLD. 11

• • •

65-0790
SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM,
AD-616 054 FLD. 11

• • •

65-0791
SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
AD-616 055 FLD. 20

• • •

65-0792
ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUMGOLD (UBER DIE KRISTAL LSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-

GOLD UND RUBIDIUM-GOLD),
AD-616 053 FLD. 20

• • •

65-0793
EFFECT OF UNIAXIAL STRESSES ON THE PARAMAGNETIC SPECTRA OF MN(3+) AND FE(3+) IN MGO
AD-616 052 FLD. 20

• • •

65-0795
A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XEON,
AD-616 212 FLD. 20

• • •

65-0796
CRITICAL ANALYSIS OF THE THERMODYNAMIC DATA FOR PT AND A PREDICTION OF THETA (DW) (T),
AD-616 213 FLD. 20

• • •

65-0798
HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE,
AD-616 208 FLD. 14

• • •

65-0799
MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES,
AD-616 211 FLD. 7

• • •

65-0800
ELECTRON HALL MOBILITY IN THE ALKALI HALIDES,
AD-616 210 FLD. 20

• • •

65-0801
SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE,
AD-616 209 FLD. 20

• • •

65-0802
HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID,
AD-616 220 FLD. 20

• • •

65-0803
ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM
AD-616 221 FLD. 20

• • •

65-0804
GATED INTEGRATOR FOR REPETITIVE SIGNALS,
AD-616 222 FLD. 14

• • •

65-0809
GAUGE THEORY OF ELEMENTARY INTERACTIONS,
AD-616 099 FLD. 20

• • •

65-0810
BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>5
AD-616 056 FLD. 20

• • •

65-0811
MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS
AD-616 219 FLD. 20

• • •

65-0813
DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM,
AD-616 218 FLD. 20

• • •

65-0814
SPIN AND GRAVITATION
AD-616 217 FLD. 20

• • •

65-0815
I=0 PION-PION AMPLITUDE AND SIGMA DI-PION,
AD-616 216 FLD. 20

• • •

65-0816
EVIDENCE THAT THE DEUTERON IS NOT AN ELEMENTARY PARTICLE
AD-616 214 FLD. 20

• • •

65-0820
ON THE SECOND 2 + LEVEL OF NI(58),
AD-616 199 FLD. 20

• • •

65-0821
IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS,
AD-616 200 FLD. 20

• • •

65-0822
SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES,
AD-616 205 FLD. 20

• • •

65-0823
CONCERNING SPACE-TIME AND SYMMETRY GROUPS,
AD-616 206 FLD. 20

• • •

65-0824
COVARIANT MERGING OF SPIN AND UNITARY SPIN,
AD-616 207 FLD. 20

• • •

65-0825
ELECTROMAGNETIC AND WEAK INTERACTIONS,
AD-616 050 FLD. 20

• • •

65-0828
SU(6) AND CHARGE FORM FACTORS,
AD-616 051 FLD. 20

• • •

65-0838
IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS
AD-616 047 FLD. 20

• • •

65-0842
LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY,
AD-616 048 FLD. 18

• • •

65-0920
THE VORTICAL LAYER ON AN INCLINED CONE,
AD-616 204 FLD. 1

• • •

65-0988
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION,
AD-616 936 FLD. 10

• • •

65-1071
A NEW METHOD FOR THE PREPARATION OF SUCCESSIVE REPLICAS FOR USE IN ELECTRON MICROSCOPY,
AD-616 340 FLD. 14

•AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

• • •

TR-64-110
THEORETICAL STUDIES OF HEAVY ION EXCHANGE IN AIR.
AD-616 103 FLD. 4

• • •

TR-64-143
ANALYSIS OF FREE-FIELD DATA IN A HALFSPACE UNDER DYNAMIC LOADS.
AD-615 906 FLD. 20

• • •

TR-64-155
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS,
AD-616 344 FLD. 11

• • •

TR-64-172
EXCITED-STATE WAVE FUNCTIONS.
AD-615 976 FLD. 20

• • •

TR-65-10
A COMPUTER PROGRAM INCORPORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIATION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM.
AD-616 106 FLD. 9

• • •

TR-65-18
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-616 000 FLD. 9

• • •

TR-65-35
GAMMA SCANNING OF SATAR SATELLITE WL-912.
AD-615 929 FLD. 22

•AIRBORNE INSTRUMENTS LAB DEER PARK N Y

• • •

8893 SP 1
HEIGHT CODE TABLES FOR USE WITH AIR TRAFFIC CONTROL RADAR BEACON SYSTEM,
AD-615 818 FLD. 1

•ALCOA RESEARCH LABS ALUMINUM CO OF AMERICA NEW KENSINGTON PA

• • •

INVESTIGATION OF THE MECHANISM OF STRESS CORROSION OF ALUMINUM ALLOYS.
AD-615 789 FLD. 11

•ALLISON DIV GENERAL MOTORS CORP INDIANAPOLIS IND

• • •

EDR 4296
MEASUREMENT OF FLUID PROPERTIES FOR MAGNETOPLASMADYNAMIC POWER GENERATORS.
AD-616 260 FLD. 9

•AMERICAN GEOGRAPHICAL SOCIETY NEW YORK

• • •

THE ECOLOGY OF MALNUTRITION IN MIDDLE AFRICA (GHANA, NIGERIA, REPUBLIC OF THE CONGO, RWANDA BURUNDI, AND THE FORMER FRENCH EQUATORIAL AFRICA), VOLUME V.
AD-616 297 FLD. 6

•AMERICAN OIL CO WHITING IND

• • •

DEVELOPMENT OF NONFLAMMABLE HYDRAULIC FLUID.
AD-616 096 FLD. 11

•ARACON GEOPHYSICS CO CONCORD MASS

• • •

965 4
OPERATIONAL USE OF TIROS RADIATION MEASUREMENTS. (AFCRL 65-193)
AD-616 351 FLD. 4

•ARCON CORP LEXINGTON MASS

• • •

REAL TIME COMPUTATION OF CONSTRAINED LEAST SQUARES ESTIMATORS,
AD-616 390 FLD. 12

•ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C

• • •

STRUCTURAL, CHEMICAL, PHYSICAL, AND FUNCTIONAL ALTERATIONS IN MAMMALIAN NUCLEUS FOLLOWING DIFFERENT CONDITIONS OF FREEZING, STORAGE, AND THAWING,
AD-616 024 FLD. 6

• • •

OXIDATIVE ENZYME ACTIVITY IN THE SKIN OF PATIENTS WITH PSORIASIS,
AD-616 025 FLD. 6

• • •

NORMAL VARIATIONS WITH AGING OF THE AMOUNT OF HEMATOP OIETIC TISSUE IN BONE MARROW FROM THE ANTERIOR ILIAC CREST
AD-616 026 FLD. 6

• • •

HEMANGIOSARCOMA OF THE BREAST,
AD-616 027 FLD. 6

•ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

• • •

USAAMI TR 65 39
POLYURETHANE AS EROSION RESISTANT MATERIAL FOR HELICOPTER ROTOR BLADES.
AD-616 128 FLD. 1

•ARMY BIOLOGICAL LABS FREDERICK MD

• • •

REPRINT ACCESSION LIST 1964.
AD-616 280 FLD. 6

•ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD

• • •

CRDLR 3246
A METHOD OF SILVER PLATING GLASS BEADS.
AD-619 880 FLD. 13

•ARMY COASTAL ENGINEERING RESEARCH CENTER WASHINGTON D C

• • •

TM 10
EXPERIMENTAL STUDY OF LONGSHORE CURRENTS ON A PLANE BEACH,
AD-619 790 FLD. 8

• • •

TM 11
BEHAVIOR OF BEACH FILL AND BORROW AREA AT SEASIDE PARK, BRIDGEPORT, CONNECTICUT
AD-619 791 FLD. 13

•ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H

• • •

SNOW REMOVAL AND ICE CONTROL,
AD-619 795 FLD. 13

• • •

TR 192
STRAIN GAGE INSTRUMENTATION OF STEEL PILES IN SNOW,
AD-619 996 FLD. 13

• • •

RR 136
A SEMI-INFINITE PLATE ON AN ELASTIC FOUNDATION,
AD-616 313 FLD. 13

• • •

RR 193
MOVEMENT OF WATER IN A FILM BETWEEN GLASS AND ICE
AD-616 315 FLD. 20

• • •

RR 198
SPHERICAL WAVES IN VISCOE LASTIC MEDIA,
AD-619 999 FLD. 20

• • •

TR 120
EXCAVATIONS IN FROZEN GROUND, ALASKA, 1960-61,
AD-616 314 FLD. 13

• • •

TR 193
STUDY OF THE RAMMSONDE FOR USE IN HARD SNOW,
AD-619 997 FLD. 14

• • •

TR 199
PEDO-ECOLOGICAL INVESTIGA TIONS, BARROW, ALASKA,
AD-619 998 FLD. 8

• • •

TR-93
PENETRATION OF PROJECTILES INTO FROZEN GROUND,
AD-616 348 FLD. 19

•ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

• • •

ECOM 2973
SUPERCONDUCTIVE TANK CIRCUITS AS NETWORK ELEMENTS
AD-619 964 FLD. 9

• • •

ECOM 2963
CONTROL AND REPRODUCIBILITY OF FERRITES PREPARED BY THE FLAME SPRAY-HOT PRESS TECHNIQUE
AD-619 807 FLD. 11

• • •

ECOM 2967
ORGANIC DEPOLARIZED PRIMARY BATTERIES.
AD-616 120 FLD. 10

• • •

ECOM 2976
MONOCYCLE POSITION MODULATION
AD-619 969 FLD. 9

• • •

ECOM 2987
A STUDY OF IONOSPHERIC IRREGULARITIES AND THEIR RELATION TO LABORATORY-PRODUCED PLASMA VORTICES,
AD-616 260 FLD. 9

•ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

• • •

R 1
ANCHOR SYSTEMS FOR PREFAB RICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964,
AD-616 249 FLD. 1

• • •

TR 3 679
ANCHOR SYSTEMS FOR PREFAB RICATED MEMBRANE SURFACING FOR ARMY HELICOPTER LANDING PADS. ENGINEERING TESTS, MAY 1964,
AD-616 249 FLD. 1

•ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS

• • •

CR-63-01/2
INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
AD-619 817 FLD. 11

•ARMY MEDICAL RESEARCH LAB FORT KNOX KY

• • •

TR-64-145
THE CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
AD-619 967 FLD. 6

• • •

TR-65-11
EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY.
AD-619 916 FLD. 6

• • •

TR-65-22
PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
AD-619 921 FLD. 5

• • •

TR-65-29
WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
AD-619 979 FLD. 6

•ARMY MISSILE COMMAND REDSTONE ARSENAL ALA

• • •

RE TM 64 7
DESIGN CONSIDERATIONS FOR TRANSMISSION LINES AND PULSE-FORMING NETWORKS,
AD-619 829 FLD. 9

• • •

RF TM 64 26
AN IMPROVED STRUCTURE FOR TRIMETHYLAMINE,
AD-619 829 FLD. 7

•ARMY NATICK LABS MASS

• • •

TOLERANCE OF HOT, WET ENVIRONMENTS BY RESTING MEN
AD-616 169 FLD. 6

•ARMY RESEARCH INST OF ENVIRONMENTAL MEDICINE NATICK MASS

• • •

EFFECTS OF OVERHYDRATION ON MAN'S PHYSIOLOGICAL RESPONSES TO WORK IN THE HEAT,
AD-616 169 FLD. 6

•ARMY RESEARCH OFFICE DURHAM N C

• • •

2789:1
SOME PROPERTIES OF STIFF MACROMOLECULES. I. MOLECULAR DIMENSIONS OF A WORM-LIKE CHAIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
AD-619 909 FLD. 11

• • •

3072:9
THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE.
AD-616 033 FLD. 20

• • •

3084:6
THE SHEAR STRENGTHS OF SOME SOLIDIFIED GASES.
AD-616 071 FLD. 7

• • •

3473:10
RESISTIVE MEASUREMENTS OF STRUCTURAL EFFECTS IN SUPER CONDUCTING NIOBIUM,
AD-616 020 FLD. 20

• • •

3560:6
CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
AD-616 068 FLD. 20

• • •

3695:20
OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX,
AD-616 184 FLD. 20

• • •

3899:9
NORMAL COORDINATE ANALYSES OF HYDROGENBONDED COMPOUNDS. III. THE ACID MALEATE ION
AD-616 079 FLD. 7

• • •

3922:11
SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. II. LIGHT,
AD-616 190 FLD. 20

• • •

4109:12
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE,
AD-616 278 FLD. 12

• • •

4184:9
BOSE-EINSTEIN CONDENSATION

IN NARROW CHANNELS,
AD-616 022 FLD. 20

• • •

431:68
VISCOSITY OF TYPE-II SUPERCONDUCTURS,
AD-616 090 FLD. 20

• • •

4387:3
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM IRON GARNET,
AD-616 224 FLD. 20

• • •

4515:1
WEAK SHOCK WAVES IN THE IONOSPHERE,
AD-616 067 FLD. 4

•ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

• • •

TR-65-11
FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM.
AD-615 908 FLD. 1

• • •

TR-65-14
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION.
AD-616 104 FLD. 1

• • •

TR-65-16
THE MARVEL PROJECT. PART E. A UNIQUE SOLUTION TO THE PROBLEM OF OBTAINING TWODIMENSIONAL BOUNDARY LAYER DATA ON THE VARIABLE-CAMBER HIGH-LIFT WINGS OF THE MARVELETTE AIRCRAFT.
AD-615 928 FLD. 1

• • •

TR-65-4
INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVIATION OF LIFT FAN NOISE.
AD-616 267 FLD. 1

•ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS) WASHINGTON D C

• • •

DEPARTMENT OF DEFENSE GUIDE TO THE EVALUATION OF THE PERFORMANCE OF MAJOR DEVELOPMENT CONTRACTORS.
AD-615 844 FLD. 15

•ASTRO VAN NUYS CALIF

• • •

25165
TRANSPIRATION-FILM COOLING STUDY USING SPIRAL-WOUND RIBBON NOZZLE.
AD-615 782 FLD. 21

•AVCO EVERETT RESEARCH LAB EVERETT MASS

• • •

AMP 107
THERMAL ELECTRON IMPACT IONIZATION RATE CALCULATION FOR H, H2, HE, N2, O2, NO2, AR, AND HG,
AD-615 888 FLD. 20

•AVCO MARINE ELECTRONICS OFFICE NEW LONDON CONN

• • •

SOUND REFLECTION AND SCATTERING BY THE OCEAN BOUNDARIES.
AD-615 918 FLD. 17

•BALLISTIC SYSTEMS DIV NORTON AFB CALIF

• • •

BSD EXHIBIT 61 3C
PERMISSIBLE CONTAMINATION LIMITS AND INSPECTION CRITERIA FOR LIQUID OXYGEN, LIQUID NITROGEN, RP-1 FUEL, GASEOUS OXYGEN, GASEOUS NITROGEN, INSTRUMENT AIR AND HELIUM, COMPONENTS AND HANDLING SYSTEMS.
AD-615 894 FLD. 16

•BARKLEY AND DEXTER LABS INC FITCHBURG MASS

• • •

RESEARCH TOWARD DEVELOPMENT OF GEOMETRIC DISTANCE AND ANGLE MEASUREMENT SYSTEMS. (AFCRL 65-196)
AD-615 912 FLD. 14

•BARODYNAMICS INC GEORGETOWN COLO

• • •

PENETRATION OF PROJECTILES INTO FROZEN GROUND, (CRREL TR-93)
AD-616 348 FLD. 19

•BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA

• • •

ON THE SECOND 2 + LEVEL OF NI(58), (AFOSR 65-0820)
AD-616 199 FLD. 20

•BATTELLE MEMORIAL INST COLUMBUS OHIO

• • •

RADIATION EFFECTS IN GAAS.
AD-616 013 FLD. 18

•BATTELLE MEMORIAL INST GENEVA (SWITZERLAND)

• • •

METHODS FOR LOWER BOUNDS TO FREQUENCIES OF CONTINUOUS ELASTIC SYSTEMS, (ARL 65-46)
AD-616 345 FLD. 13

•BATTERSEA COLL OF TECH LONDON (ENGLAND)

• • •

USE OF REACTIVE ATMOSPHERES FOR THE TREATMENT OF B. C. C. METALS.
AD-616 273 FLD. 13

•BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE

• • •

EFFECT OF A LIVER BYPASS AND OVERTRANSFUSION ON 'TRAPPING' OF RED CELLS,
AD-616 170 FLD. 6

•BELL AEROSYSTEMS CO BUFFALO N Y

• • •

02 984 009
STUDY OF OPTIMUM FINAL APPROACH OF AIRCRAFT,
AD-615 893 FLD. 1

•BELL TELEPHONE LABS INC MURRAY HILL N J

• • •

ISOTHERMAL DIFFUSION IN SYSTEMS WITH GLASSLIKE TRANSITIONS,
AD-616 161 FLD. 20

•BENSON (ROBERT W) AND ASSOCIATES INC NASHVILLE TENN

• • •

EXPERIMENTAL BONE AND TISSUE VIBRATOR ASSEMBLY. (AMRL TR-65-11)
AD-615 916 FLD. 6

•BOEING CO SEATTLE WASH

• • •

A COMPUTER PROGRAM INCORPORATING THE WHITAKER THREAT MODEL INTO THE SPACE RADIATION ENVIRONMENT AND SHIELDING COMPUTER PROGRAM. (WL TR-65-10)
AD-616 106 FLD. 9

•BOEING CO SEATTLE WASH AEROSPACE DIV

• • •

FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE. (RADC TR-64-543)
AD-615 905 FLD. 17

•BOMAC DIV VARIAN ASSOCIATES BEVERLY MASS

• • •

NOISE SOURCE FOR MILLIMETER WAVELENGTH.
AD-616 274 FLD. 9

•BOSTON UNIV MASS

• • •

SPECTRAL FUNCTIONS AND LAGRANGIAN THEORIES, (AFOSR 65-0822)
AD-616 205 FLD. 20

• • •

CONCERNING SPACE-TIME AND SYMMETRY GROUPS, (AFOSR 65-0823)
AD-616 206 FLD. 20

• • •

COVARIANT MERGING OF SPIN AND UNITARY SPIN, (AFOSR 65-0824)
AD-616 207 FLD. 20

• • •

SR 2
MULTIFREQUENCY OBSERVATIONS OF EXTREMELY LOW FREQUENCY ELECTRO-MAGNETIC RADIATION (AFCRL 65-118)
AD-615 972 FLD. 4

•BRANDEIS UNIV WALTHAM MASS

• • •

IGNORABLE COORDINATES AND STEADY MOTION IN CLASSICAL MECHANICS, (AFOSR 65-0821)
AD-616 200 FLD. 20

•BROOKE ARMY MEDICAL CENTER FORT SAM HOUSTON TEX

• • •

THE OCCURRENCE OF DEINOCERITES PSEUDES DYAR AND KNAB IN THE UNITED STATES, WITH ADDITIONAL NOTES ON THE BIOLOGY OF DEINOCERITES SPECIES OF TEXAS,
AD-615 836 FLD. 6

•BROWN UNIV PROVIDENCE R I

• • •

UPSTREAM FLUCTUATIONS IN FLOW IN A FORWARD STAGNATION REGION, (ARL 65-72)
AD-616 102 FLD. 1

• • •

STUDY OF THE ATTENUATION OF ULTRASONIC SHEAR WAVES IN SUPERCONDUCTING ALUMINUM, (AFOSR 65-0784)
AD-616 203 FLD. 20

• • •

EXTENSIONS TO THEORY OF TIME-SERIES ANALYSIS.
AD-616 329 FLD. 12

•BUREAU OF NAVAL WEAPONS NAVY DEPT WASHINGTON D C

• • •

8525
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
AD-616 118 FLD. 22

• • •

8644
CONICAL SHAPED CHARGES

AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH,
AD-616 019 FLD. 8

• • •

8646
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES,
AD-616 271 FLD. 20

• • •

8717
STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION,
AD-616 143 FLD. 21

• • •

8736
OPTIMUM RC FILTERING AND INTEGRATION FOR SEQUENTIAL MEASUREMENT OF DC SIGNALS
AD-616 151 FLD. 14

• • •

8752
INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM,
AD-616 142 FLD. 20

•CALIFORNIA INST OF TECH PASADENA

• • •

MEASUREMENTS OF FLUCTUATING AIR LOADS ON A CIRCULAR CYLINDER.
AD-616 186 FLD. 1

• • •

PROPERTIES OF MASSIVE OBJECTS,
AD-616 191 FLD. 3

•CALIFORNIA UNIV BERKELEY

• • •

THE CARBON DIOXIDE RESPONSE CURVE OF THE DOG AT SEA LEVEL AND AT ALTITUDE.
(AMRL TR-64-149)
AD-615 967 FLD. 6

• • •

EVIDENCE THAT THE DEUTERON IS NOT AN ELEMENTARY PARTICLE
(AFOSR 65-0816)
AD-616 214 FLD. 20

• • •

TR 95
THE VELOCITY OF STREAMER TIPS IN IMPULSE POINT-TO-PLANE CORONA IN AIR, USING LICHTENBERG FIGURE TECHNIQUES
AD-616 076 FLD. 20

• • •

TR 96
A MODEL FOR STREAMER PROPAGATION,
AD-616 078 FLD. 20

• • •

TR 97
THE LIFETIME OF POSITIVE STREAMERS IN A PULSED POINT-TO-PLANE GAP IN ATMOSPHERIC AIR,
AD-616 077 FLD. 20

•CALIFORNIA UNIV BERKELEY DEPT OF GEOLOGY AND GEOPHYSICS

• • •

DIGITAL COMPUTER PROGRAMS FOR PALEOMAGNETIC RESEARCH.
(AFCRL 65-83 I)
AD-616 398 FLD. 8

• • •

PALEOMAGNETISM OF LATE CRETACEOUS GRANITIC PLUTONS IN THE SIERRA NEVADA, CALIFORNIA: FURTHER RESULTS.
(AFCRL 65-83 II)
AD-616 397 FLD. 8

•CALIFORNIA UNIV LA JOLLA

• • •

EFFECT OF UNIAXIAL STRESSES ON THE PARAMAGNETIC SPECTRA OF MN(2+) AND FE(2+) IN MGO
(AFOSR 65-0793)
AD-616 052 FLD. 20

• • •

ON THE CRYSTAL STRUCTURE OF THE GOLD-RICH PHASES IN THE SYSTEM GALLIUM-GOLD AND RUBIDIUMGOLD (UBER DIE KRISTALLSTRUKTUREN DER GOLDREICHSTEN PHASEN IN DEN SYSTEMEN KALIUM-GOLD UND RUBIDIUM-GOLD),
(AFOSR 65-0792)
AD-616 053 FLD. 20

• • •

SUPERCONDUCTIVITY OF ALPHA-TITANIUM SOLID SOLUTIONS WITH VANADIUM, NIOBIUM, AND TANTALUM,
(AFOSR 65-0790)
AD-616 054 FLD. 11

• • •

SUPERCONDUCTIVITY OF SODIUM TUNGSTEN BRONZES,
(AFOSR 65-0791)
AD-616 055 FLD. 20

• • •

TR 30
EXCHANGE AND CORRELATION EFFECTS IN AN INHOMOGENEOUS ELECTRON GAS,
AD-615 799 FLD. 20

•CALIFORNIA UNIV LOS ANGELES

• • •

ELASTIC SCATTERING OF DEUTERONS FROM COMPLEX NUCLEI AT HIGH ENERGIES,
AD-616 079 FLD. 20

• • •

EFFECT OF REACTION CROSS SECTION IN DETERMINING OPTICAL MODEL PARAMETERS,
AD-616 080 FLD. 20

• • •

ECONOMIES OF SCALE IN THE SAVINGS AND LOAN INDUSTRY
AD-616 153 FLD. 5

•CALIFORNIA UNIV LOS ANGELES DEPT OF PSYCHOLOGY

• • •

TR 15
A BIBLIOGRAPHY OF PUBLICATIONS RELATING TO THE SMALL GROUP.
AD-616 265 FLD. 5

•CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE

• • •

STUDIES ON THE MECHANISM OF ACTION OF CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ON STEROID HYDROXYLATIONS IN ADRENAL HOMOGENATES,
AD-616 169 FLD. 6

•CALIFORNIA UNIV RIVERSIDE DEPT OF PHYSICS

• • •

HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITY OF INTERACTING ELECTRONS IN A SOLID,
(AFOSR 65-0802)
AD-616 220 FLD. 20

• • •

ENERGY BANDS IN BODY-CENTERED AND HEXAGONAL SODIUM
(AFOSR 65-0803)
AD-616 221 FLD. 20

•CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER

• • •

LATTICE FORMATION IN COMPLEMENT FIXATION: STUDIES WITH UNIVALENT RABBIT ANTIBODY
AD-615 835 FLD. 6

• • •

IMMUNOCHEMICAL ANALYSIS OF CEREBROSPINAL FLUID,
AD-616 228 FLD. 6

•CALIFORNIA UNIV SANTA BARBARA

• • •

TR 8
A POSSIBLE MECHANISM FOR LIGHT ABSORPTION BY INTERSTELLAR GRAINS,
AD-616 227 FLD. 3

• • •

TR 9
MICROWAVE DISCHARGE CAVITIES OPERATING AT 2450 MHZ,
AD-616 075 FLD. 14

•CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION

• • •

MSRR 30
TEAM DECISION MODELS OF AN INVENTORY SUPPLY ORGANIZATION,
AD-616 112 FLD. 13

• • •

MSRR 33
A RESUME OF MATHEMATICAL RESEARCH ON INFORMATION SYSTEMS,
AD-616 113 FLD. 12

•CASE INST OF TECH CLEVELAND OHIO

• • •

SR 7
THE GYRATION OPERATOR IN NETWORK THEORY,
(AFCRL 65-249)
AD-616 329 FLD. 9

•CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS

• • •

AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
AD-615 931 FLD. 21

•CENTER FOR NAVAL ANALYSES FRANKLIN INST PHILADELPHIA PA

• • •

CNA 43 65
COST ANALYSIS IN THE CENTER FOR NAVAL ANALYSES.
AD-616 359 FLD. 13

•CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO

• • •

TN 304
BIBLIOGRAPHY ON TROPOSPHERIC PROPAGATION OF RADIO WAVES
AD-615 936 FLD. 20

• • •

TN 310
ATTENUATION OF THE GROUND WAVE OF A LOW FREQUENCY ELECTROMAGNETIC PULSE,
AD-615 937 FLD. 20

• • •

TN 313
ON THE EFFECT OF HEAVY IONS ON LF PROPAGATION, WITH SPECIAL REFERENCE TO A NUCLEAR ENVIRONMENT,
AD-615 938 FLD. 20

•CHICAGO UNIV ILL FLUID DYNAMICS AND SEDIMENT TRANSPORT LAB

• • •

TR 4
THE ANGLE OF REPOSE OF A SINGLE GRAIN ON A FIXED ROUGH BED,
AD-615 787 FLD. 8

•CINCINNATI UNIV OHIO

• • •

NEW APPROACH TO THE TWO-DIMENSIONAL HYPERSONIC BLUNT BODY PROBLEM.
(ARL 65-15)
AD-615 901 FLD. 1

• • •

RECENT RESULTS IN THEORETICAL AND EXPERIMENTAL HYPERSONICS AND THEORETICAL MAGNETOHYDRODYNAMICS.
(ARL 65-18)
AD-615 933 FLD. 1

•CLEVITE CORP CLEVELAND OHIO

• • •

SYNTHETIC QUARTZ PILOT PLANT.
AD-615 896 FLD. 13

• • •

SYNTHETIC QUARTZ.
AD-615 897 FLD. 13

•COASTAL STUDIES INST LOUISIANA STATE UNIV BATON ROUGE

• • •

CON 65 1
SOUTHERN HEMISPHERE BEACH ROCK,
AD-616 231 FLD. 8

• • •

TR 15 PT G
SOUTHERN HEMISPHERE BEACH ROCK,
AD-616 231 FLD. 8

• • •

TR 23 PT. B
BEACH PROCESS STUDIES. PART B. BEACH CUSPS,
AD-616 141 FLD. 8

•COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD

• • •

CCL 180
IDENTIFICATION AND DETERMINATION OF REACTIVE EPOXY DILUENTS BY GAS-LIQUID CHROMATOGRAPHY,
AD-615 955 FLD. 7

•COLORADO UNIV BOULDER

• • •

I=0 PION-PION AMPLITUDE AND SIGMA DI-PION,
(AFOSR 65-0815)
AD-616 216 FLD. 20

•COLUMBIA RADIATION LAB NEW YORK

• • •

SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. I. X RAYS AND NEUTRONS,
(AFOSR 3922:10)
AD-616 189 FLD. 20

• • •

SCATTERING FROM FLUIDS OF NONSPHERICAL MOLECULES. II. LIGHT,
(AROD 3922:11)
AD-616 190 FLD. 20

•COLUMBIA UNIV NEW YORK

• • •

DISLOCATION VELOCITIES IN A LINEAR CHAIN,
(AFOSR 65-0783)
AD-616 215 FLD. 20

•COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS

• • •

POSTULATED CHEMICAL BASIS FOR OBSERVED DIFFERENCES IN THE ENZYMATIC BEHAVIOUR OF CHYMOTRYPSIN AND TRYPSIN,
AD-616 081 FLD. 6

•COLUMBIA UNIV NEW YORK SCHOOL OF ENGINEERING AND APPLIED SCIENCE

• • •

THE ANALYSIS OF A SIMPLE CLASS OF MULTISTAGE INSPECTION PLANS.
AD-616 111 FLD. 13

•COPENHAGEN UNIV (DENMARK)

• • •

THE COMPOSITE OPERATING CHARACTERISTIC UNDER NORMAL AND TIGHTENED SAMPLING INSPECTION BY ATTRIBUTES,
AD-615 797 FLD. 13

•CORNELL UNIV ITHACA N Y

• • •

LOW TEMPERATURE ELECTRONIC SPECIFIC HEAT OF SIMPLE METALS
AD-616 088 FLD. 20

• • •

SOLID STATE STUDIES OF TUNGSTEN TRIOXIDE SINGLE CRYSTALS BELOW ROOM TEMPERATURE,
(AFOSR 65-0801)
AD-616 209 FLD. 20

• • •

TR 12
PHOTOIONIZATION OF KRYPTON AND ARGON IN THE 100-300 ANGSTROM RANGE,
AD-615 776 FLD. 18

• • •

TR 2
LIFETIME OF THE EXCITED I(-) CENTER IN KCl,
AD-616 082 FLD. 20

• • •

TR 3
THEORY OF THE THERMAL CONDUCTIVITY OF SUPERCONDUCTING ALLOYS WITH PARAMAGNETIC IMPURITIES,
(NYO 2391-2)
AD-615 849 FLD. 20

• • •

TR 5
CRITICAL MAGNETIC FIELD OF A THIN FILM OF SUPERCONDUCTOR
AD-615 850 FLD. 20

•CORNELL UNIV ITHACA N Y SCHOOL OF ELECTRICAL ENGINEERING

• • •

INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
(RADC TR-64-563 V1)
AD-615 961 FLD. 9

• • •

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION,
(RADC TR-64-563 V3)
AD-615 962 FLD. 9

• • •

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY,
(RADC TR-64-563 V4)
AD-615 963 FLD. 9

•CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO NORWOOD MASS

• • •

PEM FOR PRODUCTION OF FLUORINATED BARIUM TITANATE CAPACITORS FOR OPERATION TO 200C.
AD-615 899 FLD. 9

•COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y

• • •

COMPUTERS IN SOLID MECHANICS: A CASE HISTORY,
AD-615 837 FLD. 20

• • •

A STRONG LAW FOR THE MAXIMUM CUMULATIVE SUM OF INDEPENDENT RANDOM VARIABLES
AD-616 194 FLD. 12

•CRUFT LAB HARVARD UNIV CAMBRIDGE MASS

• • •

SR 3
DIELECTRIC DISPERSION IN FERROELECTRIC ROCHELLE SALT.
(AFCRL 65-250)
AD-615 930 FLD. 20

• • •

TR 464
THE LONG YAGI-UDA ARRAY
AD-615 803 FLD. 9

•DALHOUSIE UNIV HALIFAX (NOVA SCOTIA)

• • •

EFFECT OF L-NOREPINEPHRINE ON RIGHT ATRIAL PRESSURE AND THE 'SQUARE WAVE RESPONSE' TO THE VALSALVA MANEUVER,
AD-615 843 FLD. 6

•DAVID TAYLOR MODEL BASIN WASHINGTON D C

• • •

2001
THE DTMB MARK I MEASUREMENT SYSTEM FOR CABLE-TOWED BODIES
AD-615 767 FLD. 9

•DECO ELECTRONICS INC BOULDER COLO

• • •

54 F 2
10 KC/S ATMOSPHERIC NOISE PREDICTIONS,
AD-615 923 FLD. 4

•DEFENCE RESEARCH TELECOMMUNICATIONS ESTABLISHMENT OTTAWA (ONTARIO)

• • •

INTERMODULATION ANALYSIS OF A CRYSTAL MIXER,
AD-615 829 FLD. 9

• • •

A SIMPLE IONIZATION GUAGE FOR IONIZING RADIATION STUDIES ON TRANSISTORS,
AD-616 021 FLD. 14

•DEFENSE ATOMIC SUPPORT AGENCY WASHINGTON D C

• • •

1518
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS,
AD-615 801 FLD. 20

• • •

1523
A HIGH CURRENT INVESTIGATION OF A 10 MEv SBAND ELECTRON LINEAR ACCELERATOR.
AD-615 915 FLD. 18

•DEFENSE METALS INFORMATION CENTER COLUMBUS OHIO

• • •

DEFENSE METALS INFORMATION CENTER SELECTED ACCESSIONS
AD-616 389 FLD. 11

•DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN

• • •

A 239
EFFECT OF NOISE CROSSCORRELATION ON BINAURAL SIGNAL DETECTION,
AD-615 830 FLD. 17

• • •

ACOUSTICAL REPT. NO. 249
ACOUSTIC WAVE MOTION ALONG A PERIODIC SURFACE,
AD-616 060 FLD. 20

•DELAWARE UNIV NEWARK

• • •

CONSTITUTIVE EQUATIONS FOR VISCOELASTIC FLUIDS WITH

APPLICATION TO RAPID EXTERNAL FLOWS.
AD-616 083 FLD. 20

•DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)

• • •

T 429 R
IS THE BRIKNER (BRUECKNER) CYCLE REAL,
(TT 65-62279)
AD-615 768 FLD. 4

•DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV

• • •

SM 46929
FLOW SEPARATION IN HIGH SPEED FLIGHT. A REVIEW OF THE STATE-OF-THE-ART,
AD-616 236 FLD. 1

•DRESSER-IDECO CO COLUMBUS OHIO

• • •

2
TOWER FOR MULTIPLATE ANTENNA.
(AFCRL 65-241)
AD-615 784 FLD. 13

•DURHAM UNIV (ENGLAND) DEPT OF GEOLOGY

• • •

SR 3
CRUSTAL STRUCTURE OF GREAT BRITAIN,
AD-616 093 FLD. 8

•EAGLE-PICHER CO JOPLIN MO

• • •

R 16
RESEARCH ON AMMONIA BATTERY SYSTEM.
AD-615 973 FLD. 10

•ECLIPSE PIONEER DIV BENDIX CORP TETERBORO N J

• • •

ANALOG COMPUTER STUDY OF CATEGORY III ILS AIRBORNE AND GROUND EQUIPMENT STANDARDS.
(SRDS RD-65-61)
AD-616 005 FLD. 17

•ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y

• • •

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
(RADC TR-64-563 V2)
AD-615 939 FLD. 9

• • •

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
(RADC TR-64-563 V5)
AD-615 940 FLD. 9

• • •

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION
(RADC TR-64-563 V6)
AD-616 001 FLD. 9

•ELECTRONIC SYSTEMS DIV AIR FORCE SYSTEMS COMMAND BEDFORD MASS

• • •

TDR 63-468
STRESSES AT TUNNEL INTERSECTIONS,
AD-616 018 FLD. 20

• • •

TDR-63-629
STEPS TOWARD COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR,
AD-616 294 FLD. 5

• • •

TDR-64-100
A MICROWAVE TUNNEL DIODE AMPLIFIER,
AD-616 171 FLD. 9

• • •

TDR-64-106
DIGITAL SIMULATION AND MODELLING,
AD-615 831 FLD. 14

• • •

TDR-65-137
ASPECTS OF THE THEORY OF SYNTAX,
AD-616 323 FLD. 5

• • •

TDR-65-70
SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS,
AD-616 301 FLD. 12

•ELECTRONICS RESEARCH LAB UNIV OF CALIFORNIA BERKELEY

• • •

64 37
REDUCED FORMS FOR STOCHASTIC SEQUENTIAL MACHINES,
AD-616 144 FLD. 9

•ELECTRO-DYNAMICS LABS UTAH STATE UNIV LOGAN

• • •

CHEMILUMINESCENCE FROM ATMOSPHERIC GAS REACTIONS.
(AFCRL 65-291)
AD-616 338 FLD. 7

•ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF

• • •

EOS RR 20
THE IONIZATION OF CESIUM IN TUNGSTEN CAPILLARIES,
AD-615 932 FLD. 7

•EMMANUEL COLL BOSTON MASS RESEARCH LANGUAGE CENTER

• • •

E TC CH 64 21
ACTA GEOPHYSICA SINICA, VOL. 12, NO. 2, 1963: TABLE OF CONTENTS AND ABSTRACT,
(TT 65-62423)
AD-616 114 FLD. 8

• • •

E TC CH 64 23
ACTA PHYSICA SINICA, VOL. 20, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS
(TT 65-62406)
AD-615 957 FLD. 20

• • •

E TC CH 64 25
ACTA METEOROLOGICA SINICA, VOL. 34, NO. 1, 1964: TABLE OF CONTENTS AND ABSTRACTS
(TT 65-62405)
AD-615 956 FLD. 4

•EMORY UNIV ATLANTA GA

• • •

A MODEL OF GROUP ADAPTATION TO ORGANIZATIONAL CHANGE IN COMMUNICATION NETWORKS,
AD-616 279 FLD. 5

•ENGINEERING MECHANICS RESEARCH LAB UNIV OF TEXAS AUSTIN

• • •

EMRL RM 1001
CYCLIC DEFORMATION OF THIN FILMS INSIDE THE ELECTRON MICROSCOPE.
AD-616 263 FLD. 11

• • •

EMRL RM 1002
A NEW METHOD FOR THE PREPARATION OF SUCCESSIVE REPLICAS FOR USE IN ELECTRON MICROSCOPY,
(AFOSR 65-1071)
AD-616 340 FLD. 14

• • •

EMRL RM 1003
MECHANISM OF FATIGUE IN METALLIC CRYSTALS.
AD-616 341 FLD. 20

•ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL

• • •

EXPERIMENTAL OBSERVATION OF ELECTRICQUADRUPOLE HYPERFINE EFFECTS IN MUONIC X-RAY SPECTRA
AD-616 023 FLD. 20

• • •

BINDING ENERGIES OF HYPER NUCLEI WITH MASS NUMBER A>5
(AFOSR 65-0810)
AD-616 056 FLD. 20

•ERIE TECHNOLOGICAL PRODUCTS INC PA

• • •

PRODUCTION ENGINEERING MEASURE FOR RESISTOR-CAPACITOR MICROELEMENTS FOR MICROMODULES.
AD-615 826 FLD. 9

•FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA

• • •

TRANSIENT MOTION OF SPACE CHARGE THROUGH A NEUTRAL GAS
AD-616 176 FLD. 9

•FLORIDA UNIV GAINESVILLE

• • •

RADIO ASTRONOMICAL OBSERVATIONS FROM A CANYON,
AD-616 195 FLD. 3

•FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

• • •

F TS 9320
THE REFLECTION OF LIMITED WAVE TRAINS AND IMPULSES,
(TT 59-14096)
AD-616 131 FLD. 20

• • •

F TS 9491
RADIO ENGINEERING AND ELECTRONICS, 1957, VOL. 2, NO. 11 (SELECTED ARTICLES)
(TT 59-19518)
AD-616 130 FLD. 20

• • •

F TS 9547
CALCULATION OF PROCESSES IN THE COMBUSTION CHAMBER AND NOZZLE OF A LIQUID-PROPELLANT ROCKET ENGINE,
(TT 60-19471)
AD-616 129 FLD. 21

• • •

FTD MT 65 120
CERTAIN PROBLEMS OF OPTIMUM CONTROL OF THREE DIMENSIONAL MOTION OF SPACE VEHICLES,
(TT 65-62277)
AD-615 854 FLD. 22

• • •

FTD MT 65 121
CERTAIN PROBLEMS OF RENDEZVOUS OF A SPACE VEHICLE WITH AN ORBITAL STATION,
(TT 65-62278)
AD-615 855 FLD. 22

• • •

FTD MT 65 122
DETERMINATION OF ORBITS OF OBJECTS IN OUTER SPACE WITH THE HELP OF AN AUTOMATED MEASURING COMPLEX,
(TT 65-62279)

AD-615 856 FLD. 22

• • •

FTD MT 65 123
SURVEY OF WORKS CARRIED OUT IN COMPUTATIONAL CENTER OF ACADEMY OF SCIENCES OF USSR ON THE THEORY OF OPTIMAL CONTROL OF SPACECRAFT,
(TT 65-62380)
AD-615 857 FLD. 22

• • •

FTD MT 65 125
OPTIMIZATION OF FLIGHT CONTROL OF SPACECRAFT,
(TT 65-62381)
AD-615 858 FLD. 22

• • •

FTD MT 65 126
PREDICTION OF TRAJECTORY OF SPACE VEHICLE UNDER DISCRETE CONTROL,
(TT 65-62383)
AD-615 859 FLD. 22

• • •

FTD MT 65 129
ASYMPTOTICALLY STABLE STEADY-STATE ROTATIONS OF A SATELLITE,
(TT 65-62384)
AD-615 860 FLD. 22

• • •

FTD MT 65 130
THERMAL NOISE OF MEASURING DEVICES AND LIMITING ACCURACY SELF-CONTAINED GUIDANCE OF A SPACE SHIP,
AD-615 861 FLD. 22

• • •

FTD MT 65 131
OPTIMAL PROGRAM OF CORRECTION IN THE PROBLEM OF MOTION IN A GRAVITATIONAL FIELD WITH LIMITED POWER,
(TT 65-62386)
AD-615 862 FLD. 17

• • •

FTD MT 65 55
SOME CHIEF RESULTS OF INVESTIGATIONS ON THE APPLICATION OF REINFORCED CONCRETE IN HEAVY MACHINE BUILDING AND PRESS CONSTRUCTION,
(TT 65-62376)
AD-615 853 FLD. 13

• • •

FTD TT 64 1088
NEWS OF THE ACADEMY OF SCIENCES OF THE USSR. MECHANICS AND MACHINE BUILDING, NO. 1, 1964 (SELECTED ARTICLES)
(TT 65-62416)
AD-615 990 FLD. 20

• • •

FTD TT 64 1138
DETERMINING THE DEGREE OF HETEROGENEITY OF A DC AND AC ARC DISCHARGE,
(TT 65-62388)
AD-615 864 FLD. 20

• • •

FTD TT 64 1272
THE EFFECT OF ULTRAVIOLET RADIATION ON THE KINETICS OF CREEP AND DISINTEGRATION OF CAPRONE FIBERS,
(TT 65-62439)
AD-616 283 FLD. 11

• • •

FTD TT 64 1356
SYNTHESIS AND INVESTIGATION OF PROPERTIES OF CERTAIN HOMOGENEOUS AND MIXED POLYBENZIMIDAZOLES,
(TT 65-62389)
AD-615 865 FLD. 11

• • •

FTD TT 64 1360
IN AIR TURBULENCES,
(TT 65-62419)
AD-615 993 FLD. 1

• • •

FTD TT 64 1361
LABORATORIES IN SPACE
(TT 65-62412)
AD-615 986 FLD. 22

• • •

FTD TT 64 1379
AN EXPLOIT WHICH HUMANITY WILL NOT FORGET. FROM THE LOGBOOKS OF FLIERS-COSMONAUTS V. BYKOVSKII AND V. TERESHKOVA
(TT 65-62414)
AD-615 988 FLD. 16

• • •

FTD TT 64 1380
MAGNETOSTATIC PRISM FOR ADJUSTING OF ELECTRON MICROSCOPE
(TT 65-62390)
AD-615 866 FLD. 14

• • •

FTD TT 64 1381
AUTOMATIC GAMMA FLAW DETECTOR,
(TT 65-62418)
AD-615 992 FLD. 14

• • •

FTD TT 64 1384
COMPENSATION DEVICE,
(TT 65-62413)
AD-615 987 FLD. 20

• • •

FTD TT 64 1387
STUDYING SHOCK WAVE PROPAGATION IN THE SOIL,
(TT 65-62391)
AD-615 867 FLD. 8

• • •

FTD TT 64 1389
INVESTIGATING THE EFFECT OF GAMMA-RAYS, X-RAYS AND NEUTRONS ON ELECTRIC PROPERTIES OF CDS-SE AND CDSE-SE RECTIFYING SYSTEMS,
(TT 65-62392)
AD-615 868 FLD. 9

• • •

FTD TT 64 927
THE UNIVERSE: AN OPEN SEA,
(TT 65-62387)
AD-615 863 FLD. 22

• • •

FTD TT 65 108
COMPUTER TECHNOLOGY, 1963, NO. 3 (SELECTED ARTICLES)
(TT 62431)
AD-616 269 FLD. 9

• • •

FTD TT 65 11
ASPHERICITY OF THE EARTH AND ITS EFFECT ON THE MOVEMENT OF A SATELLITE,
(TT 65-62400)
AD-615 874 FLD. 16

• • •

FTD TT 65 1383
MAGNETOMETER,
(TT 65-62407)
AD-615 981 FLD. 17

• • •

FTD TT 65 14
STRENGTH OF THIN METAL FIBERS,
(TT 65-62401)
AD-615 875 FLD. 20

• • •

FTD TT 65 19
ROENTGENOGRAPHIC AND FRACTOGRAPHIC INVESTIGATION OF STEEL DESTRUCTION,
(TT 65-62402)
AD-615 876 FLD. 11

• • •

FTD TT 65 205
ARRANGEMENT FOR PHOTOGRAPHING ARTIFICIAL EARTH SATELLITES
(TT 65-62440)
AD-616 307 FLD. 22

• • •

FTD TT 65 22
CHEMICAL FIBERS, 1963, NO. 6 (SELECTED ARTICLES)
(TT 65-62408)
AD-615 982 FLD. 11

• • •

FTD TT 65 30
ELEMENTS OF AN ELECTROLUM INESCENT SCREEN,
(TT 65-62430)
AD-616 268 FLD. 17

• • •

FTD TT 65 304
DERIVATION OF NEW POLYMERS WITH BENZIMIDAZOLINE LINKS IN BASIC CHAIN,
(TT 65-62417)
AD-615 991 FLD. 7

• • •

FTD TT 65 31
RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF TICL4,
(TT 65-62409)
AD-615 983 FLD. 7

• • •

FTD TT 65 32
PULSATING COMBUSTION OF GAS BEHIND A SHOCK WAVE IN SUPERSONIC FLOW,
(TT 65-62411)
AD-615 985 FLD. 21

• • •

FTD TT 65 33
SPECTROSCOPIC INVESTIGATION OF THE STATE OF GAS BEHIND A DETONATION FRONT,
(TT 65-62410)
AD-615 984 FLD. 19

• • •

FTD TT 65 34
ON METHODS OF ECONOMIZING THE MEMORIES OF DIGITAL COMPUTERS WHEN SOLVING DIFFERENTIAL EQUATION SYSTEMS,
(TT 65-62442)
AD-616 309 FLD. 9

• • •

FTD TT 65 36
OPPOSITE CHANGES IN ELECTROPHYSIOLOGICAL REACTIONS OF THE HUMAN BRAIN IN ADOPTING THE FREQUENCY OF LIGHT FLASHES AT VESTIBULAR AND OPTOKINETIC STIMULI,
(TT 65-62444)
AD-616 311 FLD. 6

• • •

FTD TT 65 41
CATALYSIS OVER AN ORGANIC SEMICONDUCTOR, OBTAINED ON THE BASIS OF POLYACRYLONITRILE
(TT 65-62415)
AD-615 989 FLD. 7

• • •

FTD TT 65 42
DETECTION OF SIGNALS IN A STREAM OF PULSES,
(TT 65-62404)
AD-615 954 FLD. 17

• • •

FTD TT 65 429
SYNTHESIS OF AUTOMATIC CONTROL SYSTEMS BY THE METHOD OF SUCCESSIVE APPROXIMATIONS
(TT 65-62393)
AD-615 869 FLD. 14

• • •

FTD TT 65 433
ALPHA-FERROCENYLCARBONIUM SALTS,
(TT 65-62394)
AD-615 870 FLD. 7

• • •

FTD TT 65 434
CHANGES IN THE ELECTROENCEPHALOGRAM AND DERMA-GALVANIC REACTIONS IN THE PROCESS OF FORMATION OF TENTATIVE RELATIONSHIP BETWEEN MOTORIAL AND VISUAL ANALYZERS IN HUMANS,
(TT 65-62421)
AD-615 995 FLD. 5

• • •

FTD TT 65 442
STUDYING THE BEHAVIOR OF SHELLS AND PLATES UPON

IMPACT,
(TT 65-62295)
AD-615 871 FLD. 20

• • •

FTD TT 65 444
STABILITY OF AN ANISOTROPIC CIRCULAR CYLINDRICAL SHELL DURING LONGITUDINAL COMPRESSION, INTERNAL PRESSURE AND IRREGULAR HEATING IN LENGTH,
(TT 65-62396)
AD-615 872 FLD. 20

• • •

FTD TT 65 464
USING THE METHOD OF FLUOR ESCENT ANTIBODIES TO INVESTIGATE THE ANTIGEN-ANTIBODY REACTION IN TISSUES: STUDYING THE LOCALIZATION OF ANTINEPHRITIC AND ANTIHEPATIC ANTIBODIES IN HOMO-AND HETEROLOGOUS TISSUES
(TT 65-62399)
AD-615 873 FLD. 6

• • •

FTD TT 65 49
SELECTION OF FLUX FOR WELDING HIGHSTRENGTH STEEL
(TT 65-62437)
AD-616 281 FLD. 13

• • •

FTD TT 65 55
SYNTHESIS OF ANTICORROSION PIGMENT-CHROMIUM PHOSPHATE
(TT 65-62441)
AD-616 308 FLD. 11

• • •

FTD TT 65 62
NEW ADDITIVES TO FUELS AND LUBRICANTS,
(TT 65-62445)
AD-616 312 FLD. 21

• • •

FTD TT 65 63
LOW-TEMPERATURE PLASMA GENERATORS,
(TT 65-62443)
AD-616 310 FLD. 20

• • •

FTD TT 65 64
OPTIMUM TWO-PULSE PASSAGE BETWEEN ORBITS WITH SMALL INCLINATIONS AND ECCENTRICITIES
(TT 65-62438)
AD-616 282 FLD. 22

• • •

FTD TT65 50
WAYS FOR THE AUTOMATION OF NONDESTRUCTIVE WELD-JOINT INSPECTION METHODS,
(TT 65-62420)
AD-615 994 FLD. 13

•FRANKFORD ARSENAL PHILADELPHIA PA

• • •

MULTI-LEVEL INVENTORY SYSTEMS: THE CASE OF THE SPARE AIRCRAFT ENGINES,
AD-615 892 FLD. 15

•FRANKFORD ARSENAL PHILADELPHIA PA RESEARCH AND DEVELOPMENT DIRECTORATE

• • •

M65 16 1
A STANDARD ARMY MICROWAVE POWER CALIBRATION SYSTEM FOR THE 26.5 TO 40 GIGACYCLE RANGE,
AD-616 270 FLD. 14

• • •

T65 13 1
DETECTION AND EVALUATION OF SURFACE DECARBURIZATION OF STEEL COMPONENTS BY MEANS OF ROCKWELL HARDNESS TEST PROCEDURES,
AD-615 823 FLD. 11

•GAS DYNAMICS LAB NORTHWESTERN UNIV EVANSTON ILL

• • •

LAMINAR AXIALLY SYMMETRIC COMPRESSIBLE JET WITH AN ARBITRARY PRANDTL NUMBER,
(ARL 65-67)
AD-616 109 FLD. 1

•GAS DYNAMICS LAB PRINCETON UNIV N J

• • •

718
THEORIES OF THERMAL TRANS PIRATION AND MOLECULAR EFFUSION
(AFOSR 65-0645)
AD-616 285 FLD. 1

•GAUTNEY AND JONES WASHINGTON D C

• • •

64 12 65
RADIOLOGICAL DATA HANDLING SYSTEM FOR USE IN THE LOCAL LEVEL EMERGENCY OPERATING CENTER,
AD-615 911 FLD. 15

•GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

• • •

TR 519
ELECTROMAGNETIC STUDIES IN SHOCK PRODUCED PLASMAS,
AD-616 272 FLD. 20

•GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF

• • •

SPECTRAL EMISSIVITIES AND INTEGRATED INTENSITIES OF THE 6.2-MICRON FUNDAMENTAL BAND OF H2O,
AD-616 089 FLD. 20

•GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY

• • •

FZK 224
SECOND TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE,
(WL TR-65-18)
AD-616 000 FLD. 9

•GENERAL ELECTRIC CO BETHESDA MD INFORMATION SYSTEMS OPERATION

• • •

INDEXING AIDS, PROCEDURES AND DEVICES,
(RADC TR-64-582)
AD-616 342 FLD. 5

•GENERAL ELECTRIC CO CINCINNATI OHIO ADVANCED ENGINE AND TECHNOLOGY DEPT

• • •

INVESTIGATION OF METHODS FOR THE PREDICTION AND ALLEVIATION OF LIFT FAN NOISE,
(TRECOM TR-65-4)
AD-616 267 FLD. 1

•GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV

• • •

INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS,
(AMRA CR-63-01/2)
AD-615 817 FLD. 11

• • •

R65SD25
STRUCTURAL RESPONSE TO INTENSE ELECTROMAGNETIC RADIATION,
(AFOSR 65-0988)
AD-616 336 FLD. 10

• • •

65SD249
A STUDY ON THE APPLICATION OF MICROFILMING TO THE PRODUCTION, DISTRIBUTION, USE, AND RETRIEVAL OF TECHNICAL REPORTS,
AD-615 800 FLD. 5

•GENERAL ELECTRIC CO WEST LYNN MASS

• • •

SATURATED HYDROCARBON FUEL CELL PROGRAM,
AD-615 885 FLD. 10

• • •

PROCESSING OF ENGINE DATA FOR DEVELOPMENT OF TURBOJET ENGINE ANALYZER, PART II, PROCESSING OF J79-15 DATA FROM A 500 HOUR CELL TEST,
(SEG TDR-64-11 P2)
AD-616 300 FLD. 21

•GENERAL ELECTRIC RESEARCH LAB SCHENECTADY N Y

• • •

SR 1
NEW SOLID-STATE DEVICE CONCEPTS,
(AFCRL 65-296)
AD-616 350 FLD. 20

• • •

65 GC 03D4G
NEW SOLID-STATE DEVICE CONCEPTS,
(AFCRL 65-296)
AD-616 350 FLD. 20

•GEOPHYSICS CORP OF AMERICA BEDFORD MASS

• • •

64 9 A
THEORETICAL STUDIES OF HEAVY ION EXCHANGE IN AIR,
(WL TR-64-110)
AD-616 103 FLD. 4

•GEORGE WASHINGTON UNIV WASHINGTON D C SCHOOL OF ENGINEERING AND APPLIED SCIENCE

• • •

THERMAL PORTS IN LINEAR NETWORK THEORY,
AD-616 387 FLD. 20

•GEORGIA INST OF TECH ATLANTA

• • •

AN INVESTIGATION OF EDP APPLICATIONS IN USAF HOSPITALS,
AD-616 362 FLD. 6

•GOODYEAR AEROSPACE CORP AKRON OHIO

• • •

GER 12121
TEST AND EVALUATION OF AN M-151 AIR CUSHION CONVERSION KIT,
(USAAML TR-65-19)
AD-616 105 FLD. 1

•GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA

• • •

GALCIT SM 64 42
THE MECHANICAL AND OPTICAL CHARACTERIZATION OF SOLITHANE 113 AND INVESTIGATION OF OPTICAL LAG IN PHOTOVISCOELASTIC ANALYSIS,
(WL TR-64-155)
AD-616 349 FLD. 11

•GRADUATE RESEARCH CENTER OF THE SOUTHWEST DALLAS TEX

• • •

MIE SCATTERING AND ABSORPTION CROSS SECTIONS FOR ABSORBING PARTICLES,
AD-616 343 FLD. 20

•GROUP EFFECTIVENESS RESEARCH LAB UNIV OF ILLINOIS URBANA

• • •

TR 22
LEADERSHIP AND GROUP CREATIVITY UNDER VARYING CONDITIONS OF STRESS,
AD-616 327 FLD. 5

•HARRY DIAMOND LABS WASHINGTON

D C

• • •

TM 65 16
TRIANGULAR-WAVEFORM GENERATOR.
AD-616 125 FLD. 9

• • •

TM 65 19
AN EASY WAY TO DETERMINE THE SHAPE OF A DRIVING FUNCTION FROM THE RESPONSE OF A LINEAR SYSTEM.
AD-616 126 FLD. 14

• • •

TR 1284
C-BAND RECIPROCAL PHASE SHIFTERS AND AMPLITUDE MODULATORS
AD-615 778 FLD. 9

• • •

TR 1285
NOTES ON THE USE OF SEMICONDUCTOR STRAIN GAGES,
AD-615 802 FLD. 14

•HARVARD UNIV CAMBRIDGE MASS

• • •

DISCRETIZATION ERRORS FOR WELL-SET CAUCHY PROBLEMS.I.
AD-616 017 FLD. 12

• • •

FIELD THEORY OF MATTER. II,
(AFOSR 65-0465)
AD-616 182 FLD. 20

•HAWAII INST OF GEOPHYSICS HONOLULU

• • •

HIG 65 7
A DESCRIPTION OF THE FESTSA SYSTEM,
AD-616 004 FLD. 9

•HEAT TRANSFER LAB UNIV OF MINN MINNEAPOLIS

• • •

PERFORMANCE CHARACTERISTICS OF A FULLY DEVELOPED CONSTRICTED TRANSPIRATION-COOLED ARC.
(ARL 65-68)
AD-615 903 FLD. 20

•HERNER AND CO WASHINGTON D C

• • •

BASIC PARAMETERS OF RETRIEVAL TESTS,
(AFOSR 65-0593)
AD-616 175 FLD. 5

•HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF

• • •

HEPL 314
EXCITATION OF ISOMERIC STATES IN RH103 AND IN115 BY ELECTRONS,
AD-616 012 FLD. 20

• • •

HEPL 357
ELECTRON SCATTERING FROM THE MAGNETIC DIPOLE AND OCTOPOLE MOMENTS OF BERYLLIUM-9 AND BORON-11,
AD-616 193 FLD. 20

•HOOD COLL FREDERICK MD

• • •

THE CHEMISTRY OF THE CELL WALLS OF BACILLUS ANTHRACIS: THE EFFECT OF PENICILLIN,
AD-616 198 FLD. 6

•HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD

• • •

TM 1 65
AUDITORY AND ACOUSTICAL EVALUATION OF SEVERAL SHOULDER-RIFLES,
AD-615 934 FLD. 6

•IBM CORP CAMBRIDGE MASS

• • •

ATMOSPHERIC DENSITY DETERMINATION USING THE SATELLITE ANALYSIS MONITOR PROGRAM (SAM).
(AFCRL 65-25)
AD-615 924 FLD. 4

•IBM SPACE GUIDANCE CENTER OWEGO N Y

• • •

IBM 65 521 08
STUDY OF EFFECT OF HIGH-INTENSITY PULSED NUCLEAR RADIATION ON ELECTRONIC PARTS AND MATERIALS (SCORRE).
AD-616 007 FLD. 9

•IIT RESEARCH INST CHICAGO ILL

• • •

IITRI B183B2 8
EMBRITTLEMENT OF METALS BY ORGANIC LIQUIDS.
AD-616 302 FLD. 11

•IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER

• • •

NORMAL COORDINATE ANALYSES OF HYDROGENBONDED COMPOUNDS. III. THE ACID MALEATE ION
(AROD 3899:4)
AD-616 074 FLD. 7

•ILLINOIS STATE WATER SURVEY URBANA

• • •

INVESTIGATION OF THE QUANTITATIVE DETERMINATION OF POINT AND AREAL PRECIPITATION BY RADAR ECHO MEASUREMENTS.
AD-615 772 FLD. 4

•ILLINOIS UNIV URBANA

• • •

X-RAY GENERATION OF COLOR CENTERS IN ZONEREFINED KCL AND KBR,
(AFOSR 65-0767)
AD-616 036 FLD. 20

• • •

HIGH TEMPERATURE NUCLEAR MAGNETIC RESONANCE PROBE,
(AFOSR 65-0798)
AD-616 208 FLD. 14

• • •

CES MS 10
QUANTITATIVE TERRAIN FACTORS AS RELATED TO SOIL PARENT MATERIALS AND THEIR ENGINEERING CLASSIFICATION.
AD-616 362 FLD. 8

•ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING

• • •

SRS 290
EFFECT OF EXTERNAL GEOMETRY ON FATIGUE BEHAVIOR OF WELDED JOINTS.
AD-616 034 FLD. 13

• • •

SRS 291
FATIGUE BEHAVIOR OF BUTT-WELDED REINFORCING BARS IN REINFORCED CONCRETE BEAMS.
AD-616 035 FLD. 13

•ILLINOIS UNIV URBANA DEPT OF PHYSICS

• • •

SOLID STATE AND NUCLEAR RESULTS FROM MOSSBAUER STUDIES WITH I129,
(AFOSR 65-0772)
AD-616 037 FLD. 20

• • •

VISCOSITY OF TYPE-II SUPERCONDUCTORS,
(AROD 421:68)
AD-616 090 FLD. 20

• • •

ELECTRON HALL MOBILITY IN THE ALKALI HALIDES,
(AFOSR 65-0800)
AD-616 210 FLD. 20

•ILLINOIS UNIV URBANA ENGINEERING EXPERIMENT STATION

• • •

SR 2
JUNCTION EFFECTS IN COMPOUND SEMICONDUCTORS,
(AFCRL 65-271)
AD-616 002 FLD. 20

• • •

65 2 TR 5
DISPERSION CHARACTERISTICS OF A WAVEGUIDE WITH GLIDE REFLECTION SYMMETRY,
(AFCRL 65-161)
AD-615 827 FLD. 9

•IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)

• • •

ELECTROMAGNETIC AND WEAK INTERACTIONS,
(AFOSR 65-0825)
AD-616 050 FLD. 20

• • •

SU(6) AND CHARGE FORM FACTORS,
(AFOSR 65-0828)
AD-616 051 FLD. 20

• • •

GAUGE THEORY OF ELEMENTARY INTERACTIONS,
(AFOSR 65-0809)
AD-616 059 FLD. 20

• • •

TEMPORAL COHERENCE OF BLACK BODY RADIATION,
(AFOSR J508)
AD-616 223 FLD. 20

•INSTITUT D' ASTROPHYSIQUE COINTE-SCLESSIN (BELGIUM)

• • •

TN 1A
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE: REDUCTION OF THE AROSA OBSERVATIONS.
(AFCRL 64-88-A)
AD-616 250 FLD. 3

• • •

TN 1C
VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE; GRAPHICS COMPUTED FROM OBSERVATIONS MADE AT AROSA BETWEEN 1 JANUARY 1957 AND 29 OCTOBER 1958,
(AFCRL 64-88-C)
AD-616 252 FLD. 3

•INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND POLITICAL STUDIES DIV

• • •

IDA HQ 65 3518
A DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY,
AD-615 779 FLD. 15

• • •

S 186
A DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY,
AD-615 779 FLD. 15

•INSTITUTE FOR THE STUDY OF METALS UNIV OF CHICAGO ILL

• • •

BOSE-EINSTEIN CONDENSATION IN NARROW CHANNELS,
(AROD 4184:4)
AD-616 022 FLD. 20

•INSTITUTE OF BEHAVIORAL RESEARCH TEXAS CHRISTIAN UNIV FORT WORTH

• • •

ECOLOGY AND THE SCIENCE OF PSYCHOLOGY.

AD-615 765 FLD. 5

• • •

TR 6
THE SIMILARITY OF CAMPUS STUDENT ORGANIZATIONS ASSESSED THROUGH A HIERARCHICAL GROUPING PROCEDURE.
AD-615 762 FLD. 5

•INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y

• • •

POLARIZED EMISSION FROM KI:T1 AT 12K.
AD-616 021 FLD. 20

•INSTITUTE OF RUBBER RESEARCH UNIV OF AKRON OHIO

• • •

MOLECULAR STRUCTURE AND PHYSICAL BEHAVIOR OF POLYMERS. (ML TDR-64-19 P2)
AD-616 097 FLD. 11

•INSTITUTO GEOGRAFICO Y CATASTRAL MADRID (SPAIN)

• • •

CRUSTAL PHASES ACROSS THE IBERIAN PENINSULA REGION
AD-616 016 FLD. 8

•INSTRUMENTATION LAB MASS INST OF TECH CAMBRIDGE

• • •

E 1613
ADVANCED INERTIAL GYRO TEST EQUIPMENT DESIGNS. (NDC TR-65-5)
AD-616 006 FLD. 17

•INTERNATIONAL RESISTANCE CO PHILADELPHIA PA DOCUMENTED RELIABILITY DIV

• • •

RELIABLE LONG LIFE COMPONENT STUDY XLT METAL FILM RESISTOR.
AD-615 977 FLD. 9

•IONICS INC CAMBRIDGE MASS

• • •

HYDROGEN-BROMINE FUEL CELL. (AFCRL 65-34)
AD-616 108 FLD. 10

•IONOSPHERE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK

• • •

SR 233
INTRODUCTION TO THE STUDY OF AERONOMIC COLLISIONS, (AFCRL 65-191)
AD-615 970 FLD. 4

• • •

SR 236
THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA FOR OCTOBER-NOVEMBERDECEMBER, 1964, (AFCRL 65-183)
AD-615 769 FLD. 20

•IOWA STATE UNIV IOWA CITY

• • •

A SURVEY OF ELECTRONS E > 40 KEV BEYOND 5 EARTH RADII WITH EXPLORER 14.
AD-616 172 FLD. 4

• • •

ALFVEN INVARIANT IN THE FIELD OF A MAGNETIC UNIPOLE
AD-616 234 FLD. 20

• • •

THE CONTRIBUTION OF OFFICER EFFECTIVENESS REPORTING TO MANAGEMENT IN THE UNITED STATES AIR FORCE.
AD-616 326 FLD. 5

•IOWA STATE UNIV IOWA CITY DEPT OF CHEMISTRY

• • •

THE CRYSTAL STRUCTURE OF DIPENTENE PLATINUM (II) CHLORIDE. (AROD 3072:4)
AD-616 039 FLD. 20

•JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND

• • •

F 69 3
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21

• • •

I 69 2
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

• • •

JPC 386
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-615 816 FLD. 21

• • •

JPC 405
CONTINUOUS MEASUREMENT OF SOLID PROPELLANT BURNING RATES.
AD-616 098 FLD. 21

•JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE

• • •

THE STEADY-STATE SYSTEM IN IMMUNE HEMOLYSIS DESCRIPTION AND ANALYSIS: APPLICATION TO THE ENUMERATION OF SAC'S
AD-616 201 FLD. 6

•KAMAN AIRCRAFT CORP BLOOMFIELD CONN

• • •

R 5278
UH-2 HELICOPTER HIGH-SPEED FLIGHT RESEARCH PROGRAM UTILIZING JET THRUST AUGMENTATION. (TRECOM TR-65-19)
AD-616 109 FLD. 1

•KANSAS UNIV LAWRENCE

• • •

STRUCTURE OF LOW-MEDIUM MASS NUCLEI. (ARL 65-63)
AD-616 242 FLD. 20

•KNIGHTS (JAMES) CO SANDWICH ILL

• • •

CRYSTAL UNITS TYPE CR-(XM-11)/U, + TO 20 MC IN THE TYPE HC-27/U GLASS HOLDERS.
AD-616 388 FLD. 9

•LABORATORIES FOR RESEARCH AND DEVELOPMENT FRANKLIN INST PHILADELPHIA PA

• • •

DIRECT STUDY OF DISLOCATIONS IN METALS BY TRANSMISSION ELECTRON MICROSCOPY-FATIGUE DEFORMATION. (ARL 65-11)
AD-616 352 FLD. 11

•LABORATORY OF CLIMATOLOGY C W THORNTHWAITE ASSOCIATES CENTERTON N J

• • •

RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART I. ANALYSIS,
AD-616 395 FLD. 4

• • •

RECENT DEVELOPMENTS IN METEOROLOGICAL SENSORS AND MEASURING TECHNIQUES TO 150,000 FEET. PART II. BIBLIOGRAPHY.
AD-616 396 FLD. 4

•LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y

• • •

THE RELATION BETWEEN REFRACTIVE INDEX AND DENSITY OF MINERALS RELATED TO THE EARTH'S MANTLE.
AD-616 166 FLD. 8

• • •

LATTICE DYNAMICS IN GEOPHYSICS,
AD-616 167 FLD. 8

• • •

CONDITIONS FOR A DENSITY MINIMUM IN THE UPPER MANTLE
AD-616 168 FLD. 8

• • •

LGO 759
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS, (AFCRL 65-148)
AD-615 833 FLD. 8

• • •

SR 39 LGO 758
SEISMIC WAVES WITH FREQUENCIES FROM 1 TO 100 CYCLES PER SECOND RECORDED IN A DEEP MINE IN NORTHERN NEW JERSEY, (AFCRL 65-147)
AD-615 834 FLD. 8

• • •

SR 40
THE SEISMICITY OF EAST AFRICA, THE GULF OF ADEN AND THE ARABIAN AND RED SEAS, (AFCRL 65-148)
AD-615 833 FLD. 8

•LIEGE UNIV (BELGIUM)

• • •

VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE. REDUCTION OF THE AROSA OBSERVATIONS. (AFCRL 64-88 B)
AD-616 291 FLD. 3

•LINCOLN LAB MASS INST OF TECH LEXINGTON

• • •

MAGNETIC PROPERTIES OF V3+ IONS IN CUBIC SPINELS
AD-616 041 FLD. 8

• • •

JA 2443
ELECTRIC FURNACE FOR OPERATION IN OXIDIZING, NEUTRAL, AND REDUCING ATMOSPHERES TO 2400 C.
AD-616 133 FLD. 14

• • •

JA2498
HIGH EFFICIENCY VARACTOR UPPER-SIDEBAND UPCONVERTER
AD-616 132 FLD. 9

• • •

MS 1019
SPIN QUENCHING IN THE SYSTEM MNAS(1-X) P(X) AND MNAS(1-Y)SB(Y),
AD-616 042 FLD. 20

• • •

TN 1965 18
SOME ITERATIVE METHODS USING PARTIAL ORDER FOR SOLUTION OF NONLINEAR BOUNDARY VALUE PROBLEMS, (ESD TDR-65-70)
AD-616 301 FLD. 12

•LINDE DIV UNION CARBIDE CORP CLEVELAND OHIO

• • •

PRODUCTION ENGINEERING MEASURE FOR THE IMPROVED RELIABILITY OF SOLID TANTALUM CAPACITORS.
AD-615 958 FLD. 9

•LINDE DIV UNION CARBIDE CORP TONAWANDA N Y

• • •

THE PHYSIOLOGICAL EFFECTS OF ARGON, HELIUM AND THE RARE GASES.
AD-615 814 FLD. 6

•LITTLE (ARTHUR D) INC CAMBRIDGE MASS

• • •

CHARACTERISTICS OF METAL VAPORS.
(ARL 65-53)
AD-616 110 FLD. 20

•LITTON SYSTEMS INC MINNEAPOLIS MINN APPLIED SCIENCE DIV

• • •

ASD 2639
TESTING AND FURTHER DEVELOPMENT OF AN ELECTRONIC CLOUD DETECTOR.
(AFCRL 64-869)
AD-616 347 FLD. 4

• • •

2602A
ARCTIC STRATOSPHERIC TEMPERATURES AND DENSITIES, APPENDIX IV, ONLY.
(AFCRL 64-806 ADD)
AD-616 320 FLD. 4

•LITTON SYSTEMS INC WASHINGTON D C APPLIED SCIENCE DIV

• • •

ON FBM SPARE PARTS USAGE RATE DEVELOPMENT,
AD-615 913 FLD. 15

•LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF

• • •

OPTICAL-CORRELATION DETECTOR FOR THE AUDIO FREQUENCY RANGE
AD-616 065 FLD. 17

• • •

BAKEABLE MICROWAVE CAVITY FOR MEASUREMENT OF ELECTRON LOSS RATES IN PHOTOIONIZED NITRIC OXIDE,
AD-616 145 FLD. 14

• • •

ABSOLUTE TOTAL ELECTRON-HELIUM-ATOM SCATTERING CROSS SECTIONS FOR LOW ELECTRON ENERGIES,
AD-616 157 FLD. 20

• • •

THE COMBINED RADIATION PATTERN OF THREE ORTHOGONAL DIPOLES,
AD-616 235 FLD. 9

•LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS

• • •

EXCITED-STATE WAVE FUNCTIONS.
(RL TR-64-172)
AD-615 976 FLD. 20

• • •

SPATIAL VARIATION OF THE MAGNETIZATION ACROSS A FERROMAGNETIC THIN FILM IN THE BETHE-PEIERLS-WEISS APPROXIMATION,
AD-616 146 FLD. 20

• • •

SATURATION TEMPERATURE OF VITRON OR PSEUDONUCLEUS STRUCTURES IN LIQUIDS,
AD-616 147 FLD. 20

• • •

VARIATION OF ELECTRON SPECTRUM AND INTENSITY AT LOW ALTITUDES,
AD-616 179 FLD. 4

•LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF

• • •

A SIMPLE NUMERICAL SOLUTION FOR HEAT CONDUCTION IN A SOLID WITH A RECEDING SURFACE,
AD-616 156 FLD. 22

• • •

LMSC A665481
PROPELLANT CONTAINMENT UTILIZING SCREEN MESH AND PERFORATED PLATE SURFACES
AD-616 317 FLD. 21

• • •

6 62 64 10
FRACTURE TOUGHNESS OF X7006-T6351 ALUMINUM ALLOY PLATE WELDMENTS FOR THE LARGE (ADVANCED) STRUCTURES INDEPENDENT DEVELOPMENT PROJECT (TASK B) MATERIALS AND MANUFACTURING DEVELOPMENT.
AD-615 781 FLD. 11

• • •

6 65 65 15
AN INTEGRATED APPROACH TO EVALUATING THE PERFORMANCE CAPABILITIES AND PHYSIOLOGICAL STATE OF SPACECRAFT CREWS
AD-616 316 FLD. 6

• • •

6 75 65 19
TABLES OF NEUTRAL ATMOSPHERIC PROPERTIES AS A FUNCTION OF SOLAR ACTIVITY AND LOCAL TIME FROM 90 TO 10,000 KM,
AD-616 318 FLD. 4

• • •

6 75 65 29
SYMMETRIC TERNARY SWITCHING FUNCTIONS: THEIR DETECTION AND REALIZATION WITH THRESHOLD LOGIC,
AD-616 325 FLD. 9

•LOCKHEED-GEORGIA CO MARIETTA HUMAN FACTORS RESEARCH LAB

• • •

PERFORMANCE OF VIGILANCE AND MONITORING TASKS AS A FUNCTION OF WORKLOAD.
(AMRL TR-65-22)
AD-615 921 FLD. 5

•LOWELL TECHNOLOGICAL INST RESEARCH FOUNDATION MASS

• • •

IONOSPHERIC RESEARCH USING AN AIRBORNE SYSTEM.
(AFCRL 65-189)
AD-616 107 FLD. 4

• • •

15
EFFECTS OF EXTERNAL FORCES ON VIBRATING CRYSTAL PLATES.
AD-615 810 FLD. 20

•LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS

• • •

AMPLITUDE AND DECAY RATE ANALYSIS OF LOW LEVEL EXPONENTIALLY DECAYING RADIOFREQUENCY SIGNALS
AD-616 149 FLD. 9

• • •

SPIN EXCHANGE AND SURFACE RELAXATION IN THE ATOMIC HYDROGEN MASER.
AD-616 150 FLD. 20

•MADRID UNIV (SPAIN)

• • •

A STUDY OF THE TOPOGRAPHY OF CRYSTALLINE IMPERFECTIONS BY THE PARALLEL BEAM METHOD OF X-RAY DIFFRACTION (ESTUDIO TOPOGRAFICO DE LAS IMPERFECCIONES DE UN CRISTAL POR DIFRACCION DE RAYOS X) METODO DEL HAZ PARALELO),
(AFOSR 65-0743)
AD-616 061 FLD. 20

•MALLORY (P R) AND CO INC BURLINGTON MASS

• • •

SR 3
INVESTIGATION F ULTR HIGH VACUUM SPUTTERED THIN FILMS,
(AFCRL 65-345)
AD-615 971 FLD. 20

•MALLORY (P R) AND CO INC INDIANAPOLIS IND

• • •

PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS,
AD-616 299 FLD. 9

•MARINE PHYSICAL LAB UNIV OF CALIFORNIA SAN DIEGO

• • •

MPL U 17/60
THE MOTION OF A SPAR BUOY IN SWELL. PART I.
AD-615 882 FLD. 13

• • •

MPL U 21/60
THE MOTION OF A SPAR BUOY IN SWELL. PART II.
AD-615 886 FLD. 13

•MARTIN CO ORLANDO FLA

• • •

THE FORMATION, BEHAVIOR, AND PROPERTIES OF STACKING FAULTS IN CRYSTALLINE MATERIALS
AD-615 917 FLD. 11

•MARYLAND UNIV COLLEGE PARK

• • •

CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME IV, NUMBER 6,
(TT 65-62422)
AD-616 003 FLD. 6

• • •

VALIDITY OF MANY-BODY APPROXIMATION METHODS FOR A SOLVABLE MODEL. I. EXACT SOLUTIONS AND PERTURBATION THEORY,
(AFOSR 65-0775)
AD-616 057 FLD. 20

• • •

AUTOMATIC CALCULATION OF THE TRANSPORT COLLISION INTEGRALS WITH TABLES FOR THE MORSE POTENTIAL,
AD-616 229 FLD. 20

•MARYLAND UNIV COLLEGE PARK DEPT OF CHEMISTRY

• • •

AN INVESTIGATION DIRECTED TOWARD THE SYNTHESIS OF CYCLIC POLYPHENYLENES; THE CHEMISTRY OF 1,3,5-HEXATRIENE AND ITS DERIVATIVES; AND REACTIONS OF AMINES IN THE VAPOR PHASE OVER ALUMINA.
(ARL 65-55)
AD-615 900 FLD. 7

•MASSACHUSETTS INST OF TECH CAMBRIDGE

• • •

NORBERT WIENER, 1894-1964.
AD-616 066 FLD. 14

•MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING

• • •

R64 28
COMPUTER PROGRAMS FOR THE REDUCTION OF PHOTOGRAMMETRIC CLOUD DATA,
(AFCRL 64-683)
AD-616 386 FLD. 4

•MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF GEOLOGY
AND GEOPHYSICS
• • •
SR 10
MAGNETIC TAPE COPIES
OF MIT GEOPHYSICS PROGRAM
SET II (TIME SERIES PROGRAMS
FOR THE IBM 709, 7090, 7094)
(AFCRL 65-306)
AD-616 294 FLD. 8

•MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF METALLURGY
• • •
RESISTIVE MEASUREMENTS
OF STRUCTURAL EFFECTS IN SUPER
CONDUCTING NIOBIUM,
(AROD 3473:10)
AD-616 020 FLD. 20
• • •
DSR 7954
LOCAL ORDER IN LIQUID
ALLOYS,
AD-616 277 FLD. 11
• • •
TR 6
LOCAL ORDER IN LIQUID
ALLOYS,
AD-616 277 FLD. 11

•MCGILL UNIV MONTREAL (QUEBEC)
• • •
AMRG PM 75
SOME ASPECTS OF THE MIDDLE
STRATOSPHERE.
(AFCRL 65-187)
AD-616 293 FLD. 4

•MCGILL UNIV MONTREAL (QUEBEC)
STORMY WEATHER GROUP
• • •
MW 38
TWO STUDIES OF CONVECTION.
A MODEL OF CONVECTION WITH
ENTRAINMENT AND PRECIPITATION.
HIGH RADAR ECHOES FROM ALBERTA
THUNDERSTORMS,
(AFCRL 65-10)
AD-616 094 FLD. 4

•MECHANICAL TECHNOLOGY INC
LATHAM N Y
• • •
VISCOUS FLOW BETWEEN
ROTATING CONCENTRIC CYLINDERS
WITH A CIRCUMFERENTIAL PRESSURE
GRADIENT AT SPEEDS ABOVE CRITICAL
AD-616 084 FLD. 20
• • •
MTI 65TR5 II VOL.
GAS BEARING DESIGN CHARTS.
VOLUME 1. THE HYDRODYNAMIC
GAS JOURNAL BEARING AND THE
HYDRODYNAMIC GAS THRUST BEARING.
AD-615 919 FLD. 13
• • •
MTI 65TR5 II VOL. 2
GAS BEARING DESIGN CHARTS.
VOLUME 2. THE HYDROSTATIC
GAS JOURNAL BEARING AND THE
HYDROSTATIC GAS THRUST BEARING.
AD-615 920 FLD. 13

•MELLON INST PITTSBURGH PA
• • •
THERMODYNAMICS OF MATERIALS
WITH MEMORY,
(AFOSR 65-0368)
AD-616 039 FLD. 20

•METALS RESEARCH LAB BROWN
UNIV PROVIDENCE R I
• • •
GROWTH OF DISLOCATION-
FREE GALLIUM CRYSTALS.
AD-616 298 FLD. 20

•MICHIGAN STATE UNIV EAST
LANSING
• • •
LOCALIZED LATTICE VIBRATION
MODES DUE TO SUBSTITUTIONAL
MASS DEFECTS IN SODIUM IODIDE
(AFOSR 65-0779)
AD-616 058 FLD. 20
• • •
RM 132 MF & HR 15
A STOCHASTIC MODEL FOR
THE EVOLUTION OF CLOUD COVER,
E,TIMATION OF PARAMETERS AND
GOODNESS OF FIT BASED ON BOSTON
DATA.
(AFCRL 65-243)
AD-616 394 FLD. 4

•MICHIGAN UNIV ANN ARBOR
• • •
A DIGITAL COMPUTER PROGRAM
FOR CONDENSATION IN EXPANDING
ONE-COMPONENT FLOWS,
(ARL 65-58)
AD-615 902 FLD. 1
• • •
INDIVIDUAL TASK PERFORMANCE
IN A CHANGING SOCIAL STRUCTURE
AD-616 233 FLD. 5

•MICROWAVE RESEARCH INST POLYTECHNIC
INST OF BROOKLYN N Y
• • •
PIBMRI 1292 65
TWO THEOREMS ON POSITIVE-
REAL FUNCTIONS AND THEIR APPLI
CATION TO THE SYNTHESIS OF
SYMMETRIC AND ANTIMETRIC FILTERS
(RADC TR-65-86)
AD-616 266 FLD. 9
• • •
PIBMRI 1256 65
PSEUDO-RANDOM DOT SCAN
TELEVISION SYSTEMS.
(AFCRL 65-29)
AD-616 275 FLD. 17

•MINNESOTA UNIV MINNEAPOLIS
SCHOOL OF CHEMISTRY
• • •
THE EFFECT OF STRUCTURE
ON ACID-INDUCED DEOXYMERCURATION
RATES. VARIATION IN THE ALCOHOL
COMPONENT,
(AFOSR 65-0686)
AD-616 187 FLD. 7

•MINNESOTA UNIV MINNEAPOLIS
SCHOOL OF PHYSICS
• • •
CR 74
ELECTRONS, HYDROGEN AND
HELIUM NUCLEI OBSERVED IN
THE PRIMARY COSMIC RADIATION
DURING 1963,
AD-616 297 FLD. 18

•MISSISSIPPI STATE UNIV STATE
COLLEGE
• • •
RR 56
THE MARVEL PROJECT.
PART E. A UNIQUE SOLUTION
TO THE PROBLEM OF OBTAINING
TWODIMENSIONAL BOUNDARY LAYER
DATA ON THE VARIABLE-CAMBER
HIGH-LIFT WINGS OF THE MARVELETTE
AIRCRAFT.
(TRECOM TR-65-16)
AD-615 928 FLD. 1

•MITRE CORP BEDFORD MASS
• • •
DIGITAL SIMULATION AND
MODELLING,
(ESD TDR-64-106)
AD-615 821 FLD. 14
• • •
STRESSES AT TUNNEL INTERS
ECTIONS,
(ESD TDR 63-468)
AD-616 018 FLD. 20
• • •
A MICROWAVE TUNNEL DIODE
AMPLIFIER,
(ESD TDR-64-100)
AD-616 171 FLD. 9

•MOTOROLA INC CHICAGO ILL
COMMUNICATIONS DIV
• • •
DATA TRANSMISSION INVESTI
GATION (SHORT RANGE HF RADIO
DATA TRANSMISSION).
AD-615 975 FLD. 17

•MOTOROLA INC SCOTTSDALE ARIZ
• • •
INTEGRATED RADIATORS
STUDY AND INVESTIGATION.
(RADC TR-65-44)
AD-616 356 FLD. 9

•MRD DIV GENERAL AMERICAN TRANS
PORTATION CORP NILES ILL
• • •
ANALYSIS OF FREE-FIELD
DATA IN A HALFSPACE UNDER
DYNAMIC LOADS.
(WL TR-64-143)
AD-615 906 FLD. 20

•NATIONAL AVIATION FACILITIES
EXPERIMENTAL CENTER ATLANTIC
CITY N J
• • •
EVALUATION OF PLAN FOR
CENTRAL APPROACH CONTROL FACILITY
AT JACKSONVILLE.
(SRDS RD-65-43)
AD-615 952 FLD. 1

•NATIONAL ENGINEERING SCIENCE
CO PASADENA CALIF
• • •
SN 170
INVESTIGATION OF THE
FEASIBILITY OF SYNERGISTIC
ENHANCEMENT OF HALOGENATED
FIRE EXTINGUISHANTS.
(APL TR-65-10)
AD-616 101 FLD. 11

•NATIONAL MAGNET LAB MASS INST
OF TECH CAMBRIDGE
• • •
QUANTUM THEORY OF ELECTRON
GAS PLASMA OSCILLATIONS IN
A MAGNETIC FIELD,
(AFOSR 65-0730)
AD-616 042 FLD. 20
• • •
UMKLAPP CONTRIBUTION
TO BULK ABSORPTION IN SUPERCON
DUCTORS,
(AFOSR 65-0735)
AD-616 099 FLD. 20
• • •
ANTIFERROMAGNETIC RESONANCE
IN SYSTEMS WITH DZYALOSHINDKY-
MORIYA COUPLING; ORIENTATION
DEPENDENCE IN ALPHA-FE2O3
(AFOSR 65-0737)
AD-616 173 FLD. 20
• • •
INFLUENCE OF LANDAU LEVEL
BROADENING ON THE DE HAAS-
VAN ALPHEN EFFECT,
(AFOSR 65-0736)
AD-616 174 FLD. 20

•NATIONAL RESEARCH COUNCIL
OF CANADA OTTAWA (ONTARIO)
DIV OF PURE PHYSICS
• • •
NRC 8278
MEASUREMENT OF THE FARADAY
EFFECT IN A THETA-PINCH PLASMA
USING A HE-NE LASER,
AD-616 019 FLD. 20

•NAVAL AIR ENGINEERING CENTER
PHILADELPHIA PA AERONAUTICAL
MATERIALS LAB
• • •
NAEC AML 1289
INVESTIGATION OF TRANSPARENT

FLEXIBLE, HEAT SEALABLE FILMS FOR MILITARY PACKAGING APPLICATIONS,
AD-615 881 FLD. 13

•NAVAL AIR TEST CENTER PATUXENT RIVER MD

• • •

WST4 527
INVESTIGATION OF FILTER CHARACTERISTICS OF ARRAYED CONDUCTORS BETWEEN GROUND PLANES.
AD-616 239 FLD. 9

•NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

• • •

N 521
EXPERIMENTS IN THE IDENTIFICATION OF PAINTS BY ATTENUATED TOTAL REFLECTANCE.
AD-615 951 FLD. 14

• • •

R 369
DESIGN, PLACEMENT, AND RETRIEVAL OF SUBMERSIBLE TEST UNITS AT DEEP-OCEAN TEST SITES.
AD-615 769 FLD. 14

• • •

R 380
HARBOR SCREENING TESTS OF MARINE BORER INHIBITORS. VII.
AD-615 775 FLD. 6

•NAVAL HOSPITAL PHILADELPHIA PA

• • •

FEMORAL HERNIA IN CHILDREN
AD-616 155 FLD. 6

•NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)

• • •

MR005.09 1201.11.2
A VIRAL HEPATITIS STUDY ON TAIWAN; REVIEW OF 303 CASES COLLECTED FROM JULY 1959 TO JUNE 1962,
AD-615 851 FLD. 6

• • •

MR005.09 1201.12.28
REACTIONS TO OIL-ADJUVANT TRACHOMA VACCINE: TAIWAN 1962-1964,
AD-616 014 FLD. 6

•NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C

• • •

SP 70(61)
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1961.
AD-616 262 FLD. 8

• • •

SP 70(62)
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1962.
AD-616 261 FLD. 8

•NAVAL ORDNANCE LAB WHITE OAK MD

• • •

NOLTR 62 168
ONE-DIMENSIONAL HYDRODYNAMIC CODE FOR NUCLEAR-EXPLOSION CALCULATIONS,
(DASA 1518)
AD-615 801 FLD. 20

•NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF

• • •

NOTS ADPUB 124
WIT AND HUMOR. AN ANNOTATED BIBLIOGRAPHY,
AD-616 127 FLD. 5

• • •

NOTS TP 3520
PENDULUM-TYPE NUTATION DAMPER USED IN THE NASA ATMOSPHERIC STRUCTURE SATELLITE, S-6.
(NAVWEPS 8525)
AD-616 118 FLD. 22

• • •

NOTS TP 3565 REV. 1
USER'S GUIDE TO THE EXPERIMENTAL SURFACELAUNCHED WEAPON-CONTROL TEST FACILITY.
AD-615 792 FLD. 14

• • •

NOTS TP 3583
UNCONVENTIONAL WARFARE AND THE VENEZUELAN SOCIETY
AD-615 910 FLD. 5

• • •

NOTS TP 3685
CONICAL SHAPED CHARGES AGAINST BRITTLE MATERIALS INCLUDING ROCK AND EARTH,
(NAVWEPS 8644)
AD-616 019 FLD. 8

• • •

NOTS TP 3687
TABLES OF BLACK-BODY RADIATION FUNCTIONS AND THEIR DERIVATIVES,
(NAVWEPS 8646)
AD-616 271 FLD. 20

• • •

NOTS TP 3763
STUDY OF QUENCHED ALUMINUM PARTICLE COMBUSTION,
(NAVWEPS 8717)
AD-616 143 FLD. 21

• • •

NOTS TP 3795
OPTIMUM RC FILTERING AND INTEGRATION FOR SEQUENTIAL MEASUREMENT OF DC SIGNALS
(NAVWEPS 8736)
AD-616 151 FLD. 14

• • •

NOTS TP 3809
EVALUATION OF A CLOSED-CYCLE REFRIGERATOR,
AD-616 119 FLD. 13

• • •

TN 4065 63
THEORY OF THE UNSYMMETRIC NUTATION DAMPER,
AD-615 889 FLD. 20

• • •

TP 3842
INFRARED REFLECTANCE AND EMITTANCE OF SILVER AND GOLD EVAPORATED IN ULTRAHIGH VACUUM,
(NAVWEPS 8752)
AD-616 142 FLD. 20

•NAVAL RESEARCH ESTABLISHMENT DARTMOUTH (NOVA SCOTIA)

• • •

ENERGY PER UNIT-AREA SPECTRUM OF THE SHOCK WAVE FROM 1-LB TNT CHARGES EXPLODED UNDERWATER,
AD-616 154 FLD. 19

•NAVAL RESEARCH LAB WASHINGTON D C

• • •

NAREC REF 28
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER,
AD-615 811 FLD. 9

• • •

NRL MR 1568
A REFRACTIVE TECHNIQUE FOR MEASUREMENT OF WATER WAVE SLOPE,
AD-616 303 FLD. 8

• • •

NRL 6106
NIP. A FLOATING-POINT INTERPRETIVE PROGRAMMING SYSTEM FOR THE NAREC COMPUTER,
AD-615 811 FLD. 9

• • •

NRL 6225
GAS/SOLID INTERACTION AT VARIOUS DEGREES OF SURFACE COVERAGE,
AD-616 116 FLD. 7

• • •

NRL 6230
PROCEDURE FOR THE DESIGN AND ANALYSIS OF ARBITRARY LENGTH DIGITAL COUNTERS,
AD-616 117 FLD. 9

• • •

NRL 6234
PREDICTION OF FARADAY ROTATION ANGLES AT VHF AND UHF,
AD-615 822 FLD. 20

• • •

NRL 6250
SURFACE VISCOSITY OF MONOMOLECULAR FILMS OF LONG-CHAIN ALIPHATIC AMIDES, AMINES, ALCOHOLS, AND CARBOXYLIC ACIDS,
AD-616 238 FLD. 7

•NAVAL WEAPONS LAB DAHLGREN VA

• • •

NWL 1972
ON THE BIRTH AND DECAY OF VORTICES,
AD-615 770 FLD. 20

• • •

M 7/65
PROPOSED FILTERED SHIELDED CONNECTOR FOR PROTECTION OF WEAPONS FROM ELECTROMAGNETIC RADIATION,
AD-616 309 FLD. 19

•NAVY ELECTRONICS LAB SAN DIEGO CALIF

• • •

NEL 1094
EVALUATION OF EXTERNAL LIGHTING SYSTEMS FOR THE BATHYSCAPH TRIESTE,
AD-616 287 FLD. 8

• • •

NEL 1096
THE BATHYSCAPH TRIESTE TECHNOLOGICAL AND OPERATIONAL ASPECTS, 1958-1961,
AD-616 288 FLD. 8

•NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

• • •

RR 3 64
CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 1. QUANTITATIVE CONSIDERATIONS OF DESIGN AND PERFORMANCE OF CYLINDRICAL CANISTERS,
AD-615 771 FLD. 13

•NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF

• • •

GALVANIC SKIN RESPONSE AFTER SLEEP DEPRIVATION,
AD-616 028 FLD. 5

• • •

THE RELIABILITY OF PERSONALITY RATINGS UNDER VARIED ASSESSMENT CONDITIONS,
AD-616 148 FLD. 5

• • •

THE OUTCOME OF SCHIZOPHRENIA: RECENT NAVAL EXPERIENCE,
AD-616 192 FLD. 5

•NAVY UNDERWATER SOUND LAB NEW LONDON CONN

• • •

USL 644
FOAMING OF PLASTIC ON RUNNING WATER FOR MAINTAINING BUOYANCY OF FLOATING FACILITIES,
AD-616 286 FLD. 13

• • •

USL 648
EFFECT OF THEVENIN EQUIVALENT INTERNAL IMPEDANCE ON VELOCITY CONTROL AND ACOUSTIC POWFOR PLANAR BROADSIDE ARRAYS FOR DIFFERENT DRIVING LEVEL LIMITATIONS.
AD-615 773 FLD. 17

•NEVADA BUREAU OF MINES RENO DESERT RESEARCH INST
• • •
GEOLOGICAL, GEOPHYSICAL, CHEMICAL, AND HYDROLOGICAL INVESTIGATIONS OF THE SAND SPRINGS RANGE, FAIRVIEW VALLEY, AND FOURMILE FLAT, CHURCHILL COUNTY, NEVADA.
(ARPA VUF-1001)
AD-615 793 FLD. 14

•NEW MEXICO UNIV ALBUQUERQUE DEPT OF PHYSICS AND ASTRONOMY
• • •
SR 1
(1) MEASUREMENT OF ATMOSPHERIC OZONE WITH THE CHEMILUMINESCENT METHOD. (2) VERTICAL DISTRIBUTION OF ATMOSPHERIC OZONE AND ITS RELATION TO SYNOPTIC METEOROLOGICAL CONDITIONS,
(AFCRL 65-193)
AD-616 008 FLD. 4

•NEW YORK MEDICAL COLL N Y
• • •
TRANSPLANTATION OF NEONATAL PANCREAS IN THYMECTOMIZED HAMSTERS,
AD-616 089 FLD. 6

•NEW YORK NAVAL SHIPYARD BROOKLYN
• • •
240 91
UNDERWAY VIBRATION SURVEY HULL AND MAIN PROPULSION MACHINERY USS AUSTIN (LPD-4),
AD-616 237 FLD. 13

•NEW YORK STATE COLL OF CERAMICS ALFRED UNIV
• • •
THE THERMAL-MECHANICAL BEHAVIOR OF STRONTIUM ZIRCONATE.
AD-615 809 FLD. 11

•NEW YORK STATE UNIV BUFFALO
• • •
TR 8
FAMILY INTERACTION, COALITION, DISAGREEMENT, AND COMPROMISE IN PROBLEM, NORMAL, AND SYNTHETIC FAMILY TRIADS.
AD-615 766 FLD. 5

•NEW YORK UNIV N Y DEPT OF PHYSICS
• • •
N65 2
SPIN-EXCHANGE SCATTERING IN UNIFORM MAGNETIC FIELDS
AD-615 978 FLD. 20

•NEWCASTLE-UPON-TYNE UNIV (ENGLAND)
• • •
HETEROCYCLIC ORGANOBORON COMPOUNDS. PART II. PREPARATION AND PROPERTIES OF 1-AZA-5-BORATRICYCLO (3,3,3,0) UNDECANE AND RELATED COMPOUNDS,
(AFOSR 65-0691)
AD-616 188 FLD. 7

•NORTH AMERICAN AVIATION SCIENCE CENTER THOUSAND OAKS CALIF
• • •
A FUNDAMENTAL STUDY OF DEFECT-DISLOCATION INTERACTION IN NACL TYPE LATTICES.
AD-615 974 FLD. 20

•NORTH CAROLINA STATE UNIV RALEIGH
• • •
PSR 26
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE,
(AROD 4105:12)
AD-616 278 FLD. 12
• • •
TR 1
PROOF OF MOSER'S INVARIANT CURVE THEOREM IN THE ANALYTIC CASE,
(AROD 4105:12)
AD-616 278 FLD. 12

•NORTH CAROLINA UNIV CHAPEL HILL SCHOOL OF MEDICINE
• • •
SOME EFFECTS OF ANOXIA ON TISSUE METABOLISM,
AD-616 181 FLD. 6

•NORTHROP SPACE LABS HAWTHORNE CALIF
• • •
NSL 64 356
INVESTIGATION OF THE INTERACTION OF A PREIONIZED GAS WITH AN ELECTRIC ARC.
(ARL 65-48)
AD-616 353 FLD. 20

•NORTHWESTERN UNIV EVANSTON ILL
• • •
GRAIN BOUNDARY SLIDING IN ZINC BICRYSTALS,
(AFOSR 65-0768)
AD-616 045 FLD. 11

•NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
• • •
SOLID SOLUTION AND PRECIPITATION HARDENING IN MG-FE-O ALLOYS,
(AFOSR 65-0785)
AD-616 046 FLD. 11

•NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
• • •
INVESTIGATION INTO THE MECHANISM OF FREEZE DRYING.
AD-615 890 FLD. 6
• • •
KINETIC EQUATION FOR A DILUTE GAS WITH SHORT-RANGE FORCES,
AD-616 032 FLD. 20

•OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
• • •
NEAR-INFRARED EMISSION SPECTRUM OF NO,
AD-616 163 FLD. 20

•OKLAHOMA STATE UNIV STILLWATER
• • •
THE SENSORY RESPONSES OF THE HOUSE FLY, MUSCA DOMESTICA LINN., TO ATTRACTANTS.
AD-616 364 FLD. 6

•OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN
• • •
DEVELOPMENT OF A FIRE-RESISTANT WATER-BASE HYDRAULIC FLUID.
AD-615 774 FLD. 11
• • •
TR 26
A NEW SERIES OF ORGANOBORANES. VII. THE PREPARATION OF POLY-N-CARBORANYLENESILOXANES,
AD-615 819 FLD. 7

•OPERATIONS ANALYSIS OFFICE AIR FORCE LOGISTICS COMMAND WRIGHT-PATTERSON AFB OHIO
• • •
5
PRACTICAL ASPECTS OF ECONOMIC ORDER QUANTITIES
AD-615 828 FLD. 15

•OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
• • •
ORC 65 2
LAPLACE'S EQUATION AND NETWORK FLOWS,
AD-615 819 FLD. 12

•ORDNANCE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
• • •
TM 202.3991 04
A COMPUTER STUDY OF UNDERWATER SOUND RAYS AND REFRACTION EFFECTS,
AD-615 777 FLD. 20

•P E C RESEARCH ASSOCIATES INC BOULDER COLO
• • •
SINGLE OPTIMUM SPACE-TIME REFERENCING SYSTEM.
(AFCRL 65-159)
AD-615 980 FLD. 17

•PACIFIC MARINE STATION DILLON BEACH CALIF
• • •
THE PACIFIC MARINE STATION SEA WATER SYSTEM.
AD-615 788 FLD. 14

•PALMER PHYSICAL LAB PRINCETON UNIV N J
• • •
IMPLICATIONS OF SU(6) SYMMETRY FOR TOTAL CROSS SECTIONS
(AFOSR 65-0838)
AD-616 047 FLD. 20
• • •
LIFETIME AND DECAY OF UNSTABLE PARTICLES IN S-MATRIX THEORY,
(AFOSR 65-0842)
AD-616 048 FLD. 18

•PAYNE (PETER R) INC ROCKVILLE MD
• • •
CURVED JET FLOWS, VOLUME II,
(USAAML TR-65-20)
AD-616 397 FLD. 1
• • •
CURVED JET FLOWS, VOLUME I,
(USAAML TR-65-20)
AD-616 395 FLD. 1

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK
• • •
THE USE OF A NEW POTENTIAL BARRIER MODEL IN THE FOWLER-NORDHEIM THEORY OF FIELD EMISSION
(AFOSR 65-0782)
AD-616 202 FLD. 20

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF AERONAUTICAL ENGINEERING
• • •
WEAK SHOCK WAVES IN THE IONOSPHERE,
(AROD 4515:1)
AD-616 067 FLD. 4

•PENNSYLVANIA UNIV PHILADELPHIA LAB FOR RESEARCH ON THE STRUCTURE OF MATTER
• • •
INTERNAL FIELD, EXCHANGE FIELD AND ELECTRONIC RELAXATION AT THE TM(+3) ION IN LUTETIUM

IRON GARNET,
(AROD 4387:3)
AD-616 224 FLD. 20

•PHILCO CORP BLUE BELL PA
• • •
WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
(RADC TR-65-5)
AD-616 264 FLD. 9

•PICATINNY ARSENAL DOVER N J
• • •
PR 2 TR 1379
PROPERTIES OF TERNARY MIXTURES OF HIGH EXPLOSIVES
AD-615 895 FLD. 19

•PICATINNY ARSENAL DOVER N J ENGINEERING SCIENCES LAB
• • •
PLASTIC DEFORMATION OF STRUCTURES. I. PLASTIC DEFORMATION OF BEAMS,
(FDL TDR-64-64)
AD-616 330 FLD. 19

•PICKARD AND BURNS ELECTRONICS WALTHAM MASS
• • •
834A
STUDY OF IMPROVED RECEIVING TECHNIQUES FOR IONOSPHERIC SOUNDERS.
(AFCRL 63-634)
AD-616 349 FLD. 4

•PLASMADYNE CORP SANTA ANA CALIF
• • •
EVALUATION OF THERMAL PROTECTIVE SYSTEMS UNDER SIMULATED RE-ENTRY CONDITIONS,
(ML TDR-64-293)
AD-616 346 FLD. 11

•PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
• • •
THE RELATION OF COAGULATION FACTOR DEFECTS TO SURGICAL BLOOD LOSS.
AD-616 177 FLD. 6
• • •
PHLEBOEMBOLISM IN ORTHOPAEDIC TRAUMA,
AD-616 178 FLD. 6
• • •
SPECTROPHOTOMETRIC MODIFICATION OF THE TAME ASSAY FOR PROTHROMBIN,
AD-616 180 FLD. 6

•PRINCETON UNIV N J
• • •
ERP RM 76
UPON THE PARETO OPTIMALITY OF GROUP BEHAVIOR.
AD-616 290 FLD. 5
• • •
ERP RP 11
ON ECONOMIC ENTROPY.
AD-616 292 FLD. 5
• • •
RM 74
COMPOSITION OF GENERAL SUM GAMES.
AD-616 319 FLD. 5

•PURDUE UNIV LAFAYETTE IND
• • •
A SYSTEM OF INEQUALITIES FOR THE INCOMPLETE GAMMA FUNCTION AND THE NORMAL INTEGRAL,
AD-615 848 FLD. 12
• • •
OSCILLATORY CURRENT BEHAVIOR IN GASB AND ITS RELATION TO SPONTANEOUS GENERATION AND AMPLIFICATION OF ULTRASONIC FLUX,
(AROD 3695:20)
AD-616 184 FLD. 20

•RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
• • •
MONTHLY ACCESSION LIST COORDINATE INDEX, PART II.
AD-616 248 FLD. 18
• • •
REIC AL 87
MONTHLY ACCESSION LIST. ABSTRACT NO. 27565 TO 27614, PART I.
AD-616 247 FLD. 18

•RAND CORP SANTA MONICA CALIF
• • •
P 1768
RECENT EFFORTS TOWARD COORDINATED ECONOMIC PLANNING IN THE SOVIET BLOC,
AD-615 887 FLD. 5
• • •
P 1801
A SCIENTIST'S NOTES ON THE COLD WAR,
AD-616 365 FLD. 15
• • •
P 1802
DIRECTIONS OF MATHEMATICAL RESEARCH IN NONLINEAR CIRCUIT THEORY,
AD-616 366 FLD. 9
• • •
P 1803
THE FEDERAL BUDGET AS AN INDICATOR OF GOVERNMENT INTENTIONS AND THE IMPLICATIONS OF INTENTIONS,
AD-616 367 FLD. 15
• • •
P 1804
DYNAMIC PROGRAMMING AND CLASSICAL ANALYSIS,
AD-616 381 FLD. 12
• • •
P 1805
THE FAILURE OF THE UNIVERSITIES. I: SCIENTIFIC AND TECHNOLOGICAL,
AD-616 368 FLD. 5
• • •
P 1806 1
PARAMETER-FREE AND NONPARAMETRIC TOLERANCE LIMITS: THE EXPONENTIAL CASE.
AD-616 369 FLD. 12
• • •
P 1807
TABLES OF THE BINOMIAL PROBABILITY DISTRIBUTION B(RIN,P) FOR LARGE N AND SMALL P,
AD-616 370 FLD. 12
• • •
P 1809
SOME ASPECTS OF ADAPTIVE CONTROL PROCESSES,
AD-616 371 FLD. 12
• • •
P 1810
MEASURING MISSILE RELIABILITY IN PRE-LAUNCH ENVIRONMENTS.
AD-616 383 FLD. 16
• • •
P 1811
A MATHEMATICAL MODEL OF THE HUMAN EXTERNAL RESPIRATORY SYSTEM,
AD-616 372 FLD. 6
• • •
P 1812
ON A PHASE METHOD FOR TREATING STURMLIOUVILLE EQUATIONS AND PROBLEMS,
AD-616 373 FLD. 12
• • •
P 1813
THE UPPER ATMOSPHERE AS OBSERVED WITH ROCKETS AND SATELLITES.
AD-616 374 FLD. 4
• • •
P 1815
CONTINUOUS PROGRAMMING METHODS ON AN ANALOG COMPUTER
AD-616 375 FLD. 9
• • •
P 1816 NSF
POLAR AURORAL, GEOMAGNETIC, AND IONOSPHERIC DISTURBANCES
AD-616 384 FLD. 4
• • •
P 1820
AN EXPERIMENT IN CHESS PLAYING BY MACHINE,
AD-616 376 FLD. 9
• • •
P 1822
SOME SPECIAL SEARCH PROBLEMS
AD-616 377 FLD. 12
• • •
P 1823
THE USE OF MAN-MACHINE SIMULATION FOR SUPPORT PLANNING
AD-616 378 FLD. 15
• • •
P 1824
THE MUTUAL ATTRACTION OF CLOUD DROPLETS IN THE ELECTROSTATIC FIELD OF THE ATMOSPHERE
AD-616 379 FLD. 4
• • •
P 1825
AN OUT-OF-KILTER METHOD FOR MINIMAL COST FLOW PROBLEMS.
AD-615 884 FLD. 5
• • •
P 1826
A STRUCTURAL APPROACH TO MILITARY AIR TRANSPORTATION
AD-616 380 FLD. 15
• • •
P 1827
ON ONE-DIMENSIONAL INVISCID MAGNETOHYDRODYNAMIC FLOW.
AD-616 398 FLD. 20
• • •
P 1829
DYNAMIC SIMILARITY AND THE MODELING OF CLOUD DROPLETS
AD-616 399 FLD. 8
• • •
P 1830
DRAG COEFFICIENTS OF SMALL, IRREGULAR PARTICLES
AD-616 400 FLD. 1
• • •
P 1831
THE RATIONAL POINTS ON A TRANSCENDENTAL CURVE,
AD-616 401 FLD. 12
• • •
P 1834
MANNED CONTROL OF ORBITAL RENDEZVOUS,
AD-616 402 FLD. 22
• • •
P 1835
INVARIANT IMBEDDING AND NEUTRON TRANSPORT THEORY. V: DIFFUSION AS A LIMITING CASE,
AD-616 403 FLD. 20
• • •
P 1839
BALLISTIC MISSILE PAYLOAD ALLOCATION,
AD-616 405 FLD. 16
• • •
P 1840
THE CONTEXTUAL STUDY: A STRUCTURED APPROACH TO THE STUDY OF POLITICAL AND MILITARY ASPECTS OF LIMITED WAR.
AD-616 406 FLD. 5
• • •
P 1841
VEHICLES FOR EXPLORATION ON MARS,
AD-616 407 FLD. 22
• • •
P 1843

FUNCTIONAL EQUATIONS IN THE THEORY OF DYNAMIC PROGRAMMING. XI: LIMIT THEOREMS
AD-616 408 FLD. 12

• • •

P 1845
THE UPPER ATMOSPHERE AND GEOMAGNETISM,
AD-616 409 FLD. 4

• • •

P 1846
ON THE SEPARATION OF EXPONENTIALS,
AD-616 410 FLD. 12

• • •

P 1847
QUASI-CONCAVE PROGRAMMING
AD-616 411 FLD. 5

• • •

P 1848
AN INDEX OF SOVIET INDUSTRIAL OUTPUT,
AD-616 412 FLD. 5

• • •

P 1849
SOME MILITARY APPLICATIONS OF THE THEORY OF GAMES,
AD-616 413 FLD. 15

• • •

P 1850
IS DETERRENCE ENOUGH OR SHOULD WE BE PREPARED TO FIGHT A GENERAL WAR IN THE 1960'S,
AD-616 414 FLD. 5

• • •

P 1857
OPTIMUM SEARCH ROUTINES FOR AUTOMATIC FAULT LOCATION
AD-616 415 FLD. 14

• • •

P 1858
INVARIANT IMBEDDING AND MATHEMATICAL PHYSICS, I: PARTICLE PROCESSES.
AD-616 416 FLD. 20

• • •

P 1859
REPORT ON SERVICE WITH THE AMERICAN EXHIBITION IN MOSCOW,
AD-616 417 FLD. 5

• • •

P 1860
MAXIMUM TOTAL ENERGY OF THE VAN ALLEN RADIATION BELT,
AD-616 418 FLD. 8

• • •

P 1861
SPACE VEHICLE POWER PLANTS
AD-616 419 FLD. 22

• • •

P 1862
THE RESOLVABILITY OF POINT SOURCES,
AD-616 420 FLD. 17

• • •

P 1863 NSF
THE SURVEY OF THE GEOMAGNETIC FIELD IN SPACE,
AD-616 421 FLD. 8

• • •

P 1864
ASCENT GUIDANCE FOR A SATELLITE RENDEZVOUS,
AD-616 422 FLD. 22

• • •

P 1865
ON THE FUTURE OF OPERATIONS RESEARCH IN THE AIRCRAFT AND SPACE SYSTEMS INDUSTRIES,
AD-616 423 FLD. 13

• • •

P 1866
AUTOMATIC LANGUAGE-DATA PROCESSING IN SOCIOLOGY,
AD-616 424 FLD. 5

• • •

P 1867
HOW MUCH AUTOMATICITY FOR CHECKOUT EQUIPMENT,
AD-616 425 FLD. 19

• • •

P 1868
LOGISTICS RESEARCH AND MANAGEMENT SCIENCE,
AD-616 426 FLD. 15

• • •

P 1870
ASYMPTOTIC BEHAVIOR OF SOLUTIONS OF LINEAR PARABOLIC EQUATIONS,
AD-616 427 FLD. 12

• • •

P 1872
TAXATION AND THE DEMAND FOR ALCOHOLIC BEVERAGES,
AD-616 429 FLD. 5

• • •

P 1873
THE TERMS OF SOVIET-SATELLITE TRADE: A BROADENED ANALYSIS,
AD-616 430 FLD. 5

• • •

P 2295
AN INTRODUCTION TO AUTOMATED PRODUCTION CONTROL SYSTEM
AD-616 241 FLD. 13

• • •

P 2919 2
TOWARD A GENERAL THEORY OF CUSTOMS UNION FOR DEVELOPING COUNTRIES,
AD-616 305 FLD. 5

• • •

P 2977 1
HYPERSONIC VISCOUS INTERACTION ON A SLENDER BODY OF REVOLUTION WITH SURFACE MASS TRANSFER
AD-615 944 FLD. 1

• • •

P 3121
A NOTE ON SANDWICH SHELL THEORY,
AD-615 945 FLD. 13

• • •

P 3134
COST-EFFECTIVENESS: AN INTRODUCTION AND OVERVIEW
AD-616 339 FLD. 5

• • •

P 3149
JOSS: EXPERIENCE WITH AN EXPERIMENTAL COMPUTING SERVICE FOR USERS AT REMOTE TYPEWRITER CONSOLES,
AD-615 943 FLD. 9

• • •

P 3150
SOVIET AND COMMUNIST CHINESE INDUSTRIALIZATION STRATEGIES,
AD-615 942 FLD. 5

• • •

P 3151
NOTE ON A NEW COMPUTATIONAL DATA SMOOTHING PROCEDURE SUGGESTED BY MINIMUM MEAN SQUARE ERROR ESTIMATION,
AD-615 935 FLD. 14

• • •

P1837 1
GUIDE TO RUSSIAN REFERENCE AND LANGUAGE AIDS: AN ANNOTATED BIBLIOGRAPHY,
AD-616 404 FLD. 5

• • •

P1871
THEORY AND POLICY IN THE FRENCH NATIONALIZED INDUSTRIES
AD-616 428 FLD. 5

• • •

RM 3298 FF
ELECTRIC MOTOR CARS,
AD-615 883 FLD. 13

• • •

RM 4220 PR
STUDIES IN DATA SYSTEM DEVELOPMENT: THE OCAMA WEAPON SYSTEM PROJECT,
AD-615 948 FLD. 15

• • •

RM 4242 PR
MODIFY AND RESTART ROUTINES FOR SIMSCRIPT GAMES AND SIMULATION EXPERIMENTS,
AD-616 240 FLD. 9

• • •

RM 4379 AID
A POSSIBLE U.S. POLICY TOWARDS INDIAN TRANSPORTATION: AN ILLUSTRATION OF IMPROVED SECTORAL POLICIES,
AD-615 947 FLD. 13

• • •

RM 4394 PR
SOVIET NATIONAL INCOME AND PRODUCT, 1958-1962: PART I. NATIONAL INCOME AT ESTABLISHED PRICES,
AD-616 306 FLD. 5

• • •

RM 4546 PR
DRAGGING ALONG AND INVARIANT DIFFERENTIATION,
AD-615 946 FLD. 12

• • •

RM 4557 PR
ECLIPSE OBSERVATIONS FROM ORBITING SPACECRAFT,
AD-615 949 FLD. 3

• • •

RM 4580 PR
LIMIT THEOREMS INVOLVING CAPACITIES FOR RECURRENT MARKOV CHAINS,
AD-615 950 FLD. 12

•RAYTHEON CO NORWOOD MASS

• • •

RADIO PROPAGATION VIA SUBSURFACE ROCK STRATA,
(AFCRL 65-299)
AD-615 785 FLD. 20

• • •

SR 7
SUBSURFACE RADIO TRANSMISSION TESTS IN CHEYENNE MOUNTAIN,
(AFCRL 65-298)
AD-615 794 FLD. 20

•REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA

• • •

RSIC 1406
THERMAL RESISTANCE OF CONTACTING METAL SURFACES AT HELIUM TEMPERATURES,
(TT 65-62459)
AD-616 338 FLD. 20

• • •

RSIC 911
THE STRUCTURE OF PHYLLALBINE, APPLICATION OF MAGNETIC NUCLEAR RESONANCE AND MASS SPECTROMETRY TO THE STUDY OF TROPANE DERIVATIVES,
(TT 65-62458)
AD-616 337 FLD. 7

• • •

RSIC 92
AUTOMATION PROGRESS AT RSIC: THE STATUS OF ALPHA 1,
AD-615 813 FLD. 9

•RENSSELAER POLYTECHNIC INST TROY N Y

• • •

FATIGUE FAILURE OF SURFACE FILMS,
(ML TR-64-397)
AD-616 291 FLD. 20

•RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE

• • •

ADJUSTABLE RUBY INTENSITY STANDARD FOR ESR SPECTRA,
AD-615 847 FLD. 9

• • •

RELAXATION SPECTRA OF RIBONUCLEASE,

AD-616 011 FLD. 7

• • •

BOUNDS OF IMPEDANCE FUNCTIONS OF R, = L, = C, T NETWORKS
AD-616 091 FLD. 9

• • •

ANTIFERROMAGNETIC RESONANCE LINEWIDTH IN MNF2 NEAR THE TRANSITION TEMPERATURE,
AD-616 092 FLD. 20

• • •

NONEQUILIBRIUM ELECTRIC CONDUCTIVITY OF TWO-PHASE METAL VAPORS,
AD-616 162 FLD. 21

• • •

ASPECTS OF THE THEORY OF SYNTAX,
(ESD TDR-65-157)
AD-616 323 FLD. 5

• • •

THE LOGICAL STRUCTURE OF MIND. AN INQUIRY INTO THE PHILOSOPHICAL FOUNDATION OF PSYCHOLOGY AND PSYCHIATRY
AD-616 324 FLD. 5

•RIAS INC BALTIMORE MD

• • •

TR 63 6

LINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS,
AD-615 806 FLD. 12

•ROCHESTER UNIV N Y SCHOOL OF MEDICINE AND DENTISTRY

• • •

MEGAKARYOCYTE AND PLATELET PRODUCTION IN NORMAL DOGS AND DOGS SUBJECTED TO THREE TYPES OF MARROW STRESS.
AD-616 393 FLD. 6

•ROCK ISLAND ARSENAL ILL

• • •

TR 65 618

EVALUATION OF ETHYLENE PROPYLENE TERPOLYMER ELASTOMERS
AD-616 322 FLD. 11

• • •

64 3580

CORROSION RESISTANCE OF BLACK OXIDE COATINGS ON MILD AND CORROSION RESISTANT STEELS,
AD-615 991 FLD. 11

•ROCKETDYNE CANOGA PARK CALIF

• • •

R 5405 6

HIGH-ENERGY BATTERY SYSTEM STUDY,
(ECOM 03201-6)
AD-616 385 FLD. 10

• • •

RR 64 24

STEADY-STATE ROCKET COMBUSTION OF GASEOUS HYDROGEN AND LIQUID OXYGEN. PART I. EXPERIMENTAL INVESTIGATION,
(AFOSR 64-1952)
AD-615 798 FLD. 21

•ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

• • •

TR-64-543

FREQUENCY SELECTIVE LIMITER USING NUCLEAR MAGNETIC RESONANCE.
AD-615 905 FLD. 17

• • •

TR-64-563 V1

INVESTIGATION LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME I. GENERAL REPORT AND BASIC BEAM PHENOMENA.
AD-615 961 FLD. 9

• • •

TR-64-563 V2

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME II. BEAM-CIRCUIT ACTION.
AD-615 939 FLD. 9

• • •

TR-64-563 V3

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME III. BEAM-CIRCUIT INTERACTION,
AD-615 962 FLD. 9

• • •

TR-64-563 V4

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME IV. NANOSECOND PULSE STUDY,
AD-615 963 FLD. 9

• • •

TR-64-563 V5

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME V. INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA,
AD-615 940 FLD. 9

• • •

TR-64-563 V6

INVESTIGATION OF LINEAR BEAM AND NEW CONCEPTS OF MICROWAVE POWER. VOLUME VI. LASER-STIMULATED ELECTRON EMISSION
AD-616 001 FLD. 9

• • •

TR-64-582

INDEXING AIDS, PROCEDURES AND DEVICES.
AD-616 342 FLD. 5

• • •

TR-65-38

GRAPHITE STRAIN TRANSDUCER.
AD-616 100 FLD. 9

• • •

TR-65-44

INTEGRATED RADIATORS STUDY AND INVESTIGATION.
AD-616 356 FLD. 9

• • •

TR-65-5

WIDEBAND IF ELECTRONICALLY CONTROLLED CONTINUOUSLY VARIABLE TIME DELAY TECHNIQUES.
AD-616 269 FLD. 9

• • •

TR-65-86

TWO THEOREMS ON POSITIVE-REAL FUNCTIONS AND THEIR APPLICATION TO THE SYNTHESIS OF SYMMETRIC AND ANTIMETRIC FILTERS
AD-616 266 FLD. 9

•ROSWELL PARK MEMORIAL INST BUFFALO N Y

• • •

PARAMAGNETIC ABSORPTION OF L-CYSTINE DIHYDROCHLORIDE IRRADIATED AT LOW TEMPERATURE
AD-616 062 FLD. 7

• • •

PARAMAGNETIC ABSORPTION OF SINGLE CRYSTALS OF SUCCINIC ACID IRRADIATED AT LOW TEMPERATURE
AD-616 063 FLD. 20

•ROTRON MFG CO WOODSTOCK N Y

• • •

THE DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED-9 RADIO TRANSMITTER.
AD-615 820 FLD. 13

•RUTGERS -THE STATE UNIV NEW BRUNSWICK N J

• • •

A NEW DETERMINATION OF POTENTIAL PARAMETERS AND SOME VIBRATIONAL PROPERTIES OF SOLID NEON AND XEON,
(AFOSR 65-0795)
AD-616 212 FLD. 20

• • •

CRITICAL ANALYSIS OF THE THERMODYNAMIC DATA FOR PT AND A PREDICTION OF THETA (DW) (T),
(AFOSR 65-0796)
AD-616 213 FLD. 20

• • •

TR 15

THREE STUDIES OF ORGANIZATIONAL AND INDIVIDUAL DIMENSIONS OF ORGANIZATIONS,
AD-615 796 FLD. 5

• • •

TR 18

JAPANESE VS. AMERICAN VALUES,
AD-616 196 FLD. 5

•RUTGERS -THE STATE UNIV NEW BRUNSWICK N J COLL OF ENGINEERING

• • •

CHANGES IN STACKING FAULT ENERGY BY ANNEALING IN COPPER-BASE ALLOYS,
(AROD 3560:6)
AD-616 068 FLD. 20

•RYAN AERONAUTICAL CO SAN DIEGO CALIF

• • •

64B120

FLEXIBLE WING AIR CARGO GLIDER DELIVERY SYSTEM,
(TRECOM TR-65-11)
AD-615 908 FLD. 1

•SAINT LOUIS UNIV MO

• • •

PUB 127

TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE,
(AFCRL 65-142)
AD-615 838 FLD. 8

• • •

PUB 128

CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE VELOCITY INVERSION,
(AFCRL 65-143)
AD-615 839 FLD. 8

• • •

PUB 130

APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
(AFCRL 65-145)
AD-615 841 FLD. 8

• • •

PUB 131

AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES,
(AFCRL 65-146)
AD-615 842 FLD. 8

• • •

SR 10

AN APPLICATION OF THE HASKELL-THOMSON MATRIX METHOD TO THE SYNTHESIS OF THE SURFACE MOTION DUE TO DILATATIONAL WAVES,
(AFCRL 65-146)
AD-615 842 FLD. 8

• • •

SR 6

TRAVEL-TIME CURVES FOR LOW-VELOCITY CHANNEL IN THE UPPER MANTLE,
(AFCRL 65-142)
AD-615 838 FLD. 8

• • •

SR 7

CENTRAL U. S. CRUST-UPPER MANTLE STRUCTURE FROM LOVE AND RAYLEIGH WAVE PHASE

VELOCITY INVERSION,
(AFCRL 65-143)
AD-615 829 FLD. 8

• • •

SR 8 PUB. 129
A LEAST SQUARES METHOD FOR EARTHQUAKE MECHANISM DETERMINATION USING S-WAVE DATA
(AFCRL 65-144)
AD-615 840 FLD. 8

• • •

SR 9
APPLICATION OF NUMERICAL METHOD FOR S-WAVE FOCAL MECHANISM DETERMINATIONS TO EARTHQUAKES OF KAMCHATKA-KURILE ISLANDS REGION,
(AFCRL 65-145)
AD-615 841 FLD. 8

•SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX

• • •

REDUCING ACTIVITY OF HUMAN WHOLE SALIVA AS RELATED TO DENTAL CARIES EXPERIENCE
AD-616 030 FLD. 6

• • •

THE EFFECT OF DECABORANE AND PENTABORANE ON BRAIN AMINES AS INFLUENCED BY PARGYLINE HYDROCHLORIDE AND IPRONIAZID PHOSPHATE,
AD-616 158 FLD. 6

• • •

BLOOD GLUCOSE AND HYDRAZINE EFFECTS ON LIPIDS,
AD-616 159 FLD. 6

•SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA

• • •

DIVING SAUCER DESCENTS INTO SUBMARINE CANYONS,
AD-615 845 FLD. 8

•SEISMOLOGICAL LAB CALIF INST OF TECH PASADENA

• • •

UPPER MANTLE STRUCTURE OF WESTERN NORTH AMERICA FROM APPARENT VELOCITIES OF P WAVES
AD-616 298 FLD. 8

•SPACE SCIENCES LAB UNIV OF CALIFORNIA BERKELEY

• • •

ISSUE NO. 14
A CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD,
AD-616 259 FLD. 8

• • •

SERIES NO. 6
A CONDUCTING PERMEABLE SPHERE AND CYLINDER IN AN ELLIPTICALLY POLARIZED ALTERNATING MAGNETIC FIELD,
AD-616 259 FLD. 8

•SPACE-GENERAL CORP EL MONTE CALIF

• • •

TR 7
A SIX-BORON CARBORANE (CH3)2C2B6H6 AND B6H10:P(C6H5)3 FROM HEXABORANE-10,
AD-615 959 FLD. 7

•STANFORD RESEARCH INST MENLO PARK CALIF

• • •

DISTRIBUTIONS AND CHARACTERISTICS OF VARIOUS BROADSCALE AND SPECIAL CLOUD SYSTEMS.
(AFCRL 65-211)
AD-616 295 FLD. 4

•STANFORD UNIV CALIF

• • •

BOUNDS ON PROPAGATORS,
COUPLING CONSTANTS, AND VERTEX FUNCTIONS,
(AFOSR 65-0966)
AD-616 183 FLD. 20

• • •

VECTOR RETICLE, CONTROL ACTION DISPLAY IN MANUAL CONTROL OF SPACE VEHICLE ATTITUDE.
AD-616 185 FLD. 22

• • •

SPIN AND GRAVITATION
(AFOSR 65-0814)
AD-616 217 FLD. 20

• • •

TR 9
VARIATIONAL PRINCIPLES IN POTENTIAL THEORY,
AD-616 095 FLD. 20

•STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS

• • •

THE VORTICAL LAYER ON AN INCLINED CONE,
(AFOSR 65-0920)
AD-616 204 FLD. 1

•STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE

• • •

SU DMS 65 22
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER
AD-615 926 FLD. 11

• • •

SU DMS 65 23
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES,
AD-615 927 FLD. 11

• • •

TR 7
EFFECT OF GRAIN SIZE AND ANNEALING TREATMENT ON STEADY STATE CREEP OF COPPER
AD-615 926 FLD. 11

• • •

TR 8
INFLUENCE OF DIFFUSIVITY, ELASTIC MODULUS, AND STACKING FAULT ENERGY ON THE HIGH TEMPERATURE CREEP BEHAVIOR OF ALPHA BRASSES,
AD-615 927 FLD. 11

•STANFORD UNIV CALIF GRADUATE SCHOOL OF BUSINESS

• • •

TR 10
RELATION BETWEEN TALKING AND SOCIOMETRIC CHOICES,
AD-616 293 FLD. 5

•STEVENS INST OF TECH HOBOKEN N J

• • •

LINEAR PYROLYSIS OF THERMOPLASTICS IN CHEMICALLY REACTIVE ENVIRONMENTS.
AD-615 892 FLD. 11

• • •

SIT P144
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
(AFCRL 65-293)
AD-615 780 FLD. 20

• • •

SR 1
FLOW OF PLASMA AROUND A MAGNETIC DIPOLE,
(AFCRL 65-293)
AD-615 780 FLD. 20

•SYRACUSE UNIV N Y

• • •

MAGNETIC PROPERTIES OF ZIRCONIUM (III) AND HAFNIUM (III) IODIDES,
(AFOSR 65-0799)
AD-616 211 FLD. 7

•SYRACUSE UNIV N Y RESEARCH INST

• • •

MET E 1160 0369F
CRACK INITIATION IN METALLIC MATERIALS.
AD-615 786 FLD. 11

•SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY

• • •

SOME PROPERTIES OF STIFF MACROMOLECULES. I. MOLECULAR DIMENSIONS OF A WORM-LIKE CHAIN. II. HYDRODYNAMIC BEHAVIOR OF CELLULOSE TRINITRATE.
(AROD 2789:1)
AD-615 909 FLD. 11

•SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

• • •

TM 2392
TEXTIR; A NATURAL LANGUAGE INFORMATION RETRIEVAL SYSTEM.
AD-615 763 FLD. 9

•SYSTEMS RESEARCH AND DEVELOPMENT SERVICE FEDERAL AVIATION AGENCY WASHINGTON D C

• • •

RD 65 20
WIRELESS MICROPHONE/HEADSET DEVICE (TELEWALK).
AD-615 953 FLD. 17

•TECHNION -ISRAEL INST OF TECH HAIFA

• • •

MAGNETORESISTANCE BELOW MAGNETIZATION SATURATION IN PLASTICALLY DEFORMED NICKEL DOWN TO LIQUID HELIUM TEMPERATURES
(AFOSR 65-0765)
AD-616 038 FLD. 20

•TEMPLE UNIV PHILADELPHIA PA SCHOOL OF MEDICINE

• • •

CUTANEOUS MYXOID CYST, A CLINICOPATHOLOGICAL AND HISTOCHEMICAL STUDY.
AD-616 029 FLD. 6

•TEXACO EXPERIMENT INC RICHMOND VA

• • •

EXP 223
APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET.
AD-616 230 FLD. 20

• • •

TP 230
APPARATUS FOR FLASH PHOTOLYSIS KINETIC SPECTROSCOPY IN THE VACUUM ULTRAVIOLET.
AD-616 230 FLD. 20

•TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY

• • •

REF 65 8T
NORTHEAST GULF OF MEXICO HYDROGRAPHIC SURVEY DATA COLLECTED IN 1964.
AD-616 276 FLD. 8

•TEXAS INSTRUMENTS INC DALLAS

• • •

TI 03 65 33
LOW-NOISE L-BAND AMPLIFIER.
AD-616 331 FLD. 9

• • •

TI 03 65 35
THIN FILMS FORMED BY ELECTROCHEMICAL REACTIONS.
AD-615 808 FLD. 9

• • •

TI 08 65 72
NEW HIGH TEMPERATURE INFRARED TRANSMITTING GLASSES.
AD-616 115 FLD. 11

•THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y

• • •

PHONON INTERACTIONS IN CRYSTALS.
AD-615 960 FLD. 20

•TRACOR INC AUSTIN TEX

• • •

TRACOR 65 191 U
PRODUCTION MODEL ACCEPTANCE CRITERIA.
AD-615 914 FLD. 13

•TRAINING RESEARCH LAB UNIV OF ILLINOIS RBANA

• • •

TR 8
ESSENTIAL PRINCIPLES OF PROGRAMED INSTRUCTION,
AD-616 296 FLD. 5

•TRANSDUCER INFORMATION CENTER BATTELLE MEMORIAL INST COLUMBUS OHIO

• • •

TIC ACC LIST 8
QUARTERLY ACCESSION LIST 8.
AD-616 328 FLD. 14

•TRANS-SONICS INC BURLINGTON MASS

• • •

GRAPHITE STRAIN TRANSDUCER.
(RADC TR-65-38)
AD-616 100 FLD. 9

•TRG INC MELVILLE N Y

• • •

STUDY OF WAKE GENERATING SYSTEM FOR AN ASW TRAINING DEVICE.
AD-615 907 FLD. 5

• • •

160 FR
THEORETICAL RESEARCH ON LASER OSCILLATION.
(AFCRL 65-270)
AD-615 804 FLD. 20

•TRW SEMICONDUCTORS INC LAWNDALE CALIF

• • •

PRODUCTION ENGINEERING MEASURE. TRANSISTOR, VHF, SILICON, POWER (25W-100MC).
AD-615 898 FLD. 9

•TUFTS UNIV BOSTON MASS SCHOOL OF MEDICINE

• • •

LIPASES OF BLOOD AND TISSUES. III. PURIFICATION AND PROPERTIES OF PANCREATIC LIPASE,
AD-616 069 FLD. 6

•TUFTS UNIV MEDFORD MASS

• • •

STEPS TOWARD COMPUTER SIMULATION OF SMALL GROUP BEHAVIOR,
(ESD TDR-63-629)
AD-616 294 FLD. 5

•UED EARTH SCIENCES DIV TELEDYNE SYSTEMS CO ALEXANDRIA VA

• • •

SEISMIC DLR 121
SEISMIC PARTIAL COHERENCY STUDY.
AD-616 255 FLD. 17

•UNITED NUCLEAR CORP WHITE PLAINS N Y DEVELOPMENT DIV

• • •

UNC 5108
GAMMA SCANNING OF SATAR SATELLITE WL-412.
(WL TR-65-35)
AD-615 925 FLD. 22

•UTAH UNIV SALT LAKE CITY

• • •

AMPLITUDE, ENERGY, AND PHASE ANGLES OF PLANE SV WAVES AND THEIR APPLICATION TO EARTH CRUSTAL STUDIES,
AD-616 160 FLD. 8

•VALPEY FISHER CORP HOLLISTON MASS

• • •

QUARTZ CRYSTAL UNIT CR- •
(XM-37)/U.
AD-616 256 FLD. 9

•VANDERBILT UNIV NASHVILLE TENN

• • •

THE COLOR PROBLEM.
AD-616 382 FLD. 8

•VARIAN ASSOCIATES PALO ALTO CALIF

• • •

ER 312 IF
A HIGH CURRENT INVESTIGATION OF A 10 MEV SBAND ELECTRON LINEAR ACCELERATOR.
(DASA 1523)
AD-615 915 FLD. 18

•VIRGINIA UNIV CHARLOTTESVILLE

• • •

THE SHEAR STRENGTHS OF SOME SOLIDIFIED GASES.
(AROD 3084:6)
AD-616 071 FLD. 7

•WALTER REED ARMY INST OF RESEARCH WASHINGTON D C

• • •

STUDIES ON THE FEEDING RESPONSE OF MOSQUITOES TO NUTRITIVE SOLUTIONS IN A NEW MEMBRANE FEEDER,
AD-616 072 FLD. 6

• • •

THE COMPARISON OF THE 1-C(14)-GLUCOSE AND 6-C(14)-GLUCOSE METABOLISM OF RETICULOCYTE RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS,
AD-616 073 FLD. 6

• • •

THE EFFECT OF PULSATILE FLOW ON RENAL BLOOD FLOW DURING EXTRACORPOREAL CIRCULATION
AD-616 134 FLD. 6

• • •

BORRELIAE, HUMAN RELAPSING FEVER, AND PARASITE-VECTOR-HOST RELATIONSHIPS,
AD-616 135 FLD. 6

• • •

SURVIVAL OF SHIGELLA AND SALMONELLA IN A NEW TRANSPORT MEDIUM,
AD-616 136 FLD. 6

• • •

PERITONEAL TRANSPORT OF ANTIBIOTICS IN MAN,
AD-616 137 FLD. 6

• • •

POLAROGRAPHIC DETERMINATION OF TRACES OF GOLD IN BLOOD AND SERUM,
AD-616 138 FLD. 6

• • •

A KINETIC STUDY OF THE MYENTERIC NEURONES. SIZE VARIATIONS IN THE NEUROVEGETATIVE PERIPHERY WITH BODY WEIGHT AND ORGAN SIZE,
AD-616 139 FLD. 6

•WASHINGTON UNIV SEATTLE

• • •

EFFECTS OF FREEZING AND THAWING ON THE STRUCTURE, CHEMICAL CONSTITUTION, AND FUNCTION OF CYTOPLASMIC STRUCTURES
AD-616 226 FLD. 6

•WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS

• • •

DYNAMIC NUCLEAR ENHANCEMENT IN METALLIC SODIUM,
(AFOSR 65-0813)
AD-616 218 FLD. 20

• • •

MATRIX ELEMENTS OF A FERMION SYSTEM IN A REPRESENTATION OF CORRELATED BASIS FUNCTIONS
(AFOSR 65-0811)
AD-616 219 FLD. 20

• • •

GATED INTEGRATOR FOR REPETITIVE SIGNALS,
(AFOSR 65-0804)
AD-616 222 FLD. 14

•WESTERN ELECTRIC CO INC NEW YORK

• • •

MICROWAVE SOLID-STATE DEVICES.
AD-615 891 FLD. 9

•WESTON OBSERVATORY MASS

• • •

SR 1
COMPENDIUM OF MEASURED RHEO-OPTICAL PROPERTIES OF HYSOL 4485,
(AFCRL 65-358)
AD-616 391 FLD. 11

•WHIRLPOOL CORP ST JOSEPH MICH RESEARCH AND ENGINEERING LABS

• • •

WATER RECLAMATION FROM URINE THERMOELECTRIC SYSTEM.
(AMRL TR-65-29)
AD-615 979 FLD. 6

•WILLIAMSON DEVELOPMENT CO INC CONCORD MASS

• • •

RESEARCH DIRECTED TOWARD PLASMA STABILITY STUDIES IN MAGNETIC FIELDS.
(AFCRL 65-315)
AD-616 099 FLD. 20

•WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS

• • •

IMPROVEMENTS IN THE CONTINUOUS SEISMIC PROFILER,
AD-616 087 FLD. 8

• • •

REF 64 92
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
AD-615 877 FLD. 8

• • •

REF 65 16
NARRATIVE CHAIN CRUISE NO. 38, 5-16 AUGUST 1963,
AD-615 878 FLD. 8

• • •

REF 65 9
NARRATIVE OF CHAIN CRUISE NO. 43, 15 FEBRUARY21 AUGUST 1964.
AD-616 392 FLD. 8

•YALE UNIV NEW HAVEN CONN

• • •

ENERGY OF GRAIN BOUNDARIES IN HALITE.
(AFOSR 65-0769)
AD-616 049 FLD. 11

CONTRACT INDEX

The fields indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

•AF AFOSR100 61
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AFOSR 65-0782)
AD-616 202 FLD. 20

•AF AFOSR16 63
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF CHEMISTRY
(AFOSR 65-0686)
AD-616 187 FLD. 7

•AF AFOSR167 62
RUTGERS -THE STATE UNIV NEW BRUNSWICK N J
(AFOSR 65-0796)
AD-616 213 FLD. 20
(AFOSR 65-0795)
AD-616 212 FLD. 20

•AF AFOSR192 62
ILLINOIS UNIV URBANA
(AFOSR 65-0798)
AD-616 208 FLD. 14

•AF AFOSR207 63
JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND
F AD-615 816 FLD. 21

•AF AFOSR207 64
JET PROPULSION CENTER PURDUE UNIV LAFAYETTE IND
A AD-616 098 FLD. 21

•AF AFOSR213 63
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AFOSR 65-0782)
AD-616 202 FLD. 20

•AF AFOSR228 63
COLUMBIA UNIV NEW YORK
(AFOSR 65-0783)
AD-616 215 FLD. 20

•AF AFOSR232 63
CALIFORNIA UNIV BERKELEY
(AFOSR 65-0816)
AD-616 214 FLD. 20

•AF AFOSR267 63
BROWN UNIV PROVIDENCE R I
(AFOSR 65-0784)
AD-616 203 FLD. 20

•AF AFOSR30 63
COLORADO UNIV BOULDER
(AFOSR 65-0815)
AD-616 216 FLD. 20

•AF AFOSR318 62
CALIFORNIA UNIV RIVERSIDE DEPT OF PHYSICS
(AFOSR 65-0802)
AD-616 220 FLD. 20
(AFOSR 65-0803)
AD-616 221 FLD. 20

•AF AFOSR327 63
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
(AFOSR 65-0785)
AD-616 046 FLD. 11

•AF AFOSR368 63
BRANDEIS UNIV WALTHAM MASS
(AFOSR 65-0821)
AD-616 200 FLD. 20

•AF AFOSR385 63
BOSTON UNIV MASS
(AFOSR 65-0822)
AD-616 205 FLD. 20
(AFOSR 65-0823)
AD-616 206 FLD. 20
(AFOSR 65-0824)
AD-616 207 FLD. 20

•AF AFOSR401 63
BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA
(AFOSR 65-0820)
AD-616 199 FLD. 20

•AF AFOSR46 64
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR 65-0825)
AD-616 050 FLD. 20

•AF AFOSR469 65
STEVENS INST OF TECH HOBOKEN N J
(AFCRL 65-293)
AD-615 780 FLD. 20

•AF AFOSR960 64
ENGINEERING MECHANICS RESEARCH LAB UNIV OF TEXAS AUSTIN
AD-616 263 FLD. 11
(AFOSR 65-1071)
AD-616 340 FLD. 14
AD-616 341 FLD. 20

•AF AFOSR62 213
SYRACUSE UNIV N Y
(AFOSR 65-0799)
AD-616 211 FLD. 7

•AF AFOSR62 215
ILLINOIS UNIV URBANA DEPT OF PHYSICS
(AFOSR 65-0800)
AD-616 210 FLD. 20

•AF AFOSR62 218
CORNELL UNIV ITHACA N Y
(AFOSR 65-0801)
AD-616 209 FLD. 20

•AF AFOSR62 246
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR J508)
AD-616 223 FLD. 20

•AF AFOSR62 280
MICROWAVE RESEARCH INST POLYTECHNIC INST OF BROOKLYN N Y
(RADC TR-65-86)
AD-616 266 FLD. 9

•AF AFOSR62 320
WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS
(AFOSR 65-0804)
AD-616 222 FLD. 14

•AF AFOSR62 398
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR 65-0810)
AD-616 056 FLD. 20

•AF AFOSR62 363
AEROELASTIC AND STRUCTURES RESEARCH LAB MASS INST OF TECH CAMBRIDGE
(AFOSR 65-0639)
AD-616 321 FLD. 1

•AF AFOSR62 37
MICHIGAN STATE UNIV EAST LANSING
(AFOSR 65-0779)
AD-616 058 FLD. 20

•AF AFOSR62 412
WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS
(AFOSR 65-0813)
AD-616 218 FLD. 20
(AFOSR 65-0811)
AD-616 219 FLD. 20

•AF AFOSR62 492
STANFORD UNIV CALIF
(AFOSR 65-0814)
AD-616 217 FLD. 20

•AF AFOSR62 96
MARYLAND UNIV COLLEGE PARK
(AFOSR 65-0775)
AD-616 057 FLD. 20

•AF AFOSR631 64
CALIFORNIA UNIV LA JOLLA
(AFOSR 65-0793)
AD-616 052 FLD. 20
(AFOSR 65-0792)
AD-616 053 FLD. 20
(AFOSR 65-0790)
AD-616 054 FLD. 11
(AFOSR 65-0791)
AD-616 055 FLD. 20

•AF AFOSR96 63
STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
(AFOSR 65-0920)
AD-616 204 FLD. 1

•AF EOAR62 27
NEWCASTLE-UPON-TYNE UNIV (ENGLAND)
(AFOSR 65-0691)
AD-616 188 FLD. 7

•AF EOAR62 87
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR 65-0828)
AD-616 051 FLD. 20
(AFOSR 65-0809)
AD-616 059 FLD. 20

•AF EOAR62 92
MADRID UNIV (SPAIN)
(AFOSR 65-0743)
AD-616 061 FLD. 20

•AF04 611 10378
CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS
AD-615 931 FLD. 21

•AF04 611 10387
ASTRO VAN NUYS CALIF
AD-615 782 FLD. 21

•AF04 611 6083
TEXACO EXPERIMENT INC RICHMOND VA
AD-616 230 FLD. 20

•AF04 611 7439
AEROJET-GENERAL CORP SACRAMENTO CALIF
(AFRPL TR-65-97)
AD-616 284 FLD. 13

•AF19 604 4973
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING
(AFCRL 64-683)
F AD-616 386 FLD. 4

•AF19 604 6190
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
AD-616 163 FLD. 20

•AF19 604 7344
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
(AFOSR 65-0730)
AD-616 042 FLD. 20
(AFOSR 65-0735)
AD-616 044 FLD. 20
(AFOSR 65-0737)
AD-616 173 FLD. 20
(AFOSR 65-0736)
AD-616 174 FLD. 20

•AF19 604 7376
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
(AFCRL 65-148)
AD-615 833 FLD. 8

•AF19 604 7376 GRANT
LAMONT GEOLOGICAL OBSERVATORY
PALISADES N Y
(AFCRL 65-147)
AD-615 834 FLD. 8

•AF19 604 7378
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF GEOLOGY
AND GEOPHYSICS
(AFCRL 65-306)
AD-616 294 FLD. 8

•AF19 604 7394
PICKARD AND BURNS ELECTRONICS
WALTHAM MASS
(AFCRL 63-634)
F AD-616 349 FLD. 4

•AF19 604 7399
SAINT LOUIS UNIV MO
(AFCRL 65-142)
AD-615 838 FLD. 8
(AFCRL 65-143)
AD-615 839 FLD. 8
(AFCRL 65-144)
AD-615 840 FLD. 8
(AFCRL 65-145)
AD-615 841 FLD. 8
(AFCRL 65-146)
AD-615 842 FLD. 8

•AF19 604 8431
MCGILL UNIV MONTREAL (QUEBEC)
(AFCRL 65-187)
F AD-616 253 FLD. 4

•AF19 604 8508
IONICS INC CAMBRIDGE MASS
(AFCRL 65-24)
F AD-616 108 FLD. 10

•AF19 604 8817
TRG INC MELVILLE N Y
(AFCRL 65-270)
F AD-615 804 FLD. 20

•AF19 628 1681
STANFORD RESEARCH INST MENLO
PARK CALIF
(AFCRL 65-211)
F AD-616 295 FLD. 4

•AF19 628 1682
LOWELL TECHNOLOGICAL INST
RESEARCH FOUNDATION MASS
(AFCRL 65-189)
F AD-616 107 FLD. 4

•AF19 628 1699
CASE INST OF TECH CLEVELAND
OHIO
(AFCRL 65-249)
AD-616 329 FLD. 9

•AF19 628 201
UTAH UNIV SALT LAKE CITY
AD-616 160 FLD. 8

•AF19 628 212
WESTON OBSERVATORY MASS
(AFCRL 65-358)
AD-616 391 FLD. 11

•AF19 628 2390
BOSTON UNIV MASS
(AFCRL 65-118)
AD-615 972 FLD. 4

•AF19 628 2362
RAYTHEON CO NORWOOD MASS
(AFCRL 65-299)
F AD-615 785 FLD. 20
(AFCRL 65-298)
AD-615 794 FLD. 20

•AF19 628 2386
CALIFORNIA UNIV BERKELEY
DEPT OF GEOLOGY AND GEOPHYSICS
(AFCRL 65-83 I)
F AD-616 358 FLD. 8
(AFCRL 65-83 II)
F AD-616 397 FLD. 8

•AF19 628 2390
MITRE CORP BEDFORD MASS
(ESD TDR-64-106)
AD-615 831 FLD. 14
(ESD TDR 63-468)
AD-616 018 FLD. 20
(ESD TDR-64-100)
AD-616 171 FLD. 9

•AF19 628 2398 GRANT
STEVENS INST OF TECH HOBOKEN
N J
(AFCRL 65-293)
AD-615 780 FLD. 20

•AF19 628 2480
TUFTS UNIV MEDFORD MASS
(ESD TDR-63-629)
AD-616 294 FLD. 5

•AF19 628 2487
RESEARCH LAB OF ELECTRONICS
MASS INST OF TECH CAMBRIDGE
(ESD TDR-63-157)
AD-616 323 FLD. 5

•AF19 628 249
MCGILL UNIV MONTREAL (QUEBEC)
STORMY WEATHER GROUP
(AFCRL 65-10)
AD-616 094 FLD. 4

•AF19 628 2843
WILLIAMSON DEVELOPMENT CO
INC CONCORD MASS
(AFCRL 65-315)
F AD-616 099 FLD. 20

•AF19 628 2927
NEW MEXICO UNIV ALBUQUERQUE
DEPT OF PHYSICS AND ASTRONOMY
(AFCRL 65-153)
AD-616 008 FLD. 4

•AF19 628 2977
DRESSER-IDECO CO COLUMBUS
OHIO
(AFCRL 65-341)
F AD-615 784 FLD. 13

•AF19 628 355
MICHIGAN STATE UNIV EAST
LANSING
(AFCRL 65-243)
F AD-616 394 FLD. 4

•AF19 628 370
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF CIVIL
ENGINEERING
(AFCRL 64-683)
F AD-616 386 FLD. 4

•AF19 628 3815
MICROWAVE RESEARCH INST POLYTECHNIC
INST OF BROOKLYN N Y
(AFCRL 65-29)
AD-616 275 FLD. 17

•AF19 628 3819
ILLINOIS UNIV URBANA ENGINEERING
EXPERIMENT STATION
(AFCRL 65-161)
AD-615 827 FLD. 9

•AF19 628 3821
ELECTRO-DYNAMICS LABS UTAH
STATE UNIV LOGAN
(AFCRL 65-291)
F AD-616 338 FLD. 7

•AF19 628 383
LITTON SYSTEMS INC MINNEAPOLIS
MINN APPLIED SCIENCE DIV
2602A
(AFCRL 64-806 ADD)
F AD-616 320 FLD. 4

•AF19 628 3840
MALLORY (P R) AND CO INC
BURLINGTON MASS
(AFCRL 65-345)
AD-615 971 FLD. 20

•AF19 628 3869
EMMANUEL COLL BOSTON MASS
RESEARCH LANGUAGE CENTER
(TT 65-62405)
AD-615 956 FLD. 4
(TT 65-62423)
AD-616 114 FLD. 8

•AF19 628 3874
CRUFT LAB HARVARD UNIV CAMBRIDGE
MASS
(AFCRL 65-250)
AD-615 930 FLD. 20

•AF19 628 3894
LITTON SYSTEMS INC MINNEAPOLIS
MINN APPLIED SCIENCE DIV
(AFCRL 64-869)
F AD-616 347 FLD. 4

•AF19 628 3899
BARKLEY AND DEXTER LABS INC
FITCHBURG MASS
(AFCRL 65-196)
F AD-615 912 FLD. 14

•AF19 628 3997
P E C RESEARCH ASSOCIATES
INC BOULDER COLO
(AFCRL 65-159)
F AD-615 980 FLD. 17

•AF19 628 4014
IONOSPHERE RESEARCH LAB PENNSY
LVANIA STATE UNIV UNIVERSITY
PARK
(AFCRL 65-187)
AD-615 764 FLD. 20

•AF19 628 4014 GRANT
IONOSPHERE RESEARCH LAB PENNSY
LVANIA STATE UNIV UNIVERSITY
PARK
(AFCRL 65-191)
AD-615 970 FLD. 4

•AF19 628 4043
IBM CORP CAMBRIDGE MASS
(AFCRL 65-25)
F AD-615 924 FLD. 4

•AF19 628 4074
ARACON GEOPHYSICS CO CONCORD
MASS
(AFCRL 65-193)
F AD-616 351 FLD. 4

•AF19 628 4327
ILLINOIS UNIV URBANA ENGINEERING
EXPERIMENT STATION
(AFCRL 65-271)
AD-616 002 FLD. 20

•AF19 628 4976
GENERAL ELECTRIC RESEARCH
LAB SCHENECTADY N Y
(AFCRL 65-296)
AD-616 350 FLD. 20

•AF19 628 500
LINCOLN LAB MASS INST OF TECH
LEXINGTON
AD-616 043 FLD. 20
AD-616 132 FLD. 9
AD-616 133 FLD. 14
(ESD TDR-65-70)
AD-616 301 FLD. 12

•AF19 628 5039 GRANT
GRADUATE RESEARCH CENTER OF
THE SOUTHWEST DALLAS TEX
AD-616 343 FLD. 20

•AF29 600 3916
INSTRUMENTATION LAB MASS INST
OF TECH CAMBRIDGE
(MDC TR-65-3)
AD-616 006 FLD. 17

•AF29 601 5267
GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA
(WL TR-64-155)
AD-616 349 FLD. 11

•AF29 601 5552
MRD DIV GENERAL AMERICAN TRANS PORTATION CORP NILES ILL
(WL TR-64-143)
F AD-615 906 FLD. 20

•AF29 601 6108
GEOPHYSICS CORP OF AMERICA BEDFORD MASS
(WL TR-64-110)
F AD-616 103 FLD. 4

•AF29 601 6199
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
(WL TR-64-172)
AD-615 976 FLD. 20

•AF29 601 6612
BOEING CO SEATTLE WASH
(WL TR-65-10)
AD-616 106 FLD. 9

•AF29 601 6643
GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY
(WL TR-65-18)
AD-616 000 FLD. 9

•AF29 601 6685
UNITED NUCLEAR CORP WHITE PLAINS N Y DEVELOPMENT DIV
(WL TR-65-25)
F AD-615 925 FLD. 22

•AF30 602 2868 GRANT
MICROWAVE RESEARCH INST POLYTECHNIC INST OF BROOKLYN N Y
(RADC TR-65-86)
AD-616 266 FLD. 9

•AF30 602 3096
PHILCO CORP BLUE BELL PA
(RADC TR-65-5)
F AD-616 264 FLD. 9

•AF30 602 3243
CORNELL UNIV ITHACA N Y SCHOOL OF ELECTRICAL ENGINEERING
(RADC TR-64-563 V3)
AD-615 962 FLD. 9
(RADC TR-64-563 V4)
AD-615 963 FLD. 9
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
(RADC TR-64-563 V2)
AD-615 939 FLD. 9
(RADC TR-64-563 V5)
AD-615 940 FLD. 9
(RADC TR-64-563 V6)
AD-616 001 FLD. 9
CORNELL UNIV ITHACA N Y SCHOOL OF ELECTRICAL ENGINEERING
(RADC TR-64-563 V1)
AD-615 961 FLD. 9

•AF30 602 3270
MOTOROLA INC SCOTTSDALE ARIZ
(RADC TR-65-44)
F AD-616 396 FLD. 9

•AF30 602 3276
TRANS-SONICS INC BURLINGTON MASS
(RADC TR-65-38)
F AD-616 100 FLD. 9

•AF30 602 3407
BOEING CO SEATTLE WASH AERO-SPACE DIV
(RADC TR-64-543)
F AD-615 909 FLD. 17

•AF30 602 3438
GENERAL ELECTRIC CO BETHESDA MD INFORMATION SYSTEMS OPERATION
(RADC TR-64-582)
F AD-616 342 FLD. 9

•AF33 038AC20663
BELL AEROSYSTEMS CO BUFFALO N Y
AD-615 893 FLD. 1

•AF33 615 1083
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-616 162 FLD. 21

•AF33 615 1105
NORTHROP SPACE LABS HAWTHORNE CALIF
(ARL 65-48)
AD-616 393 FLD. 20

•AF33 615 1121
DEFENSE METALS INFORMATION CENTER COLUMBUS OHIO
AD-616 389 FLD. 11

•AF33 615 1124
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
AD-616 247 FLD. 18

•AF33 615 1160
GAS DYNAMICS LAB NORTHWESTERN UNIV EVANSTON ILL
(ARL 65-67)
AD-616 109 FLD. 1

•AF33 615 1161
NATIONAL ENGINEERING SCIENCE CO PASADENA CALIF
(APL TR-65-10)
AD-616 101 FLD. 11

•AF33 615 1269
BROWN UNIV PROVIDENCE R I
(ARL 65-72)
AD-616 102 FLD. 1

•AF33 615 1819
TRANSDUCER INFORMATION CENTER BATTELLE MEMORIAL INST COLUMBUS OHIO
AD-616 328 FLD. 14

•AF33 616 7818
AEROPHYSICS LAB MASS INST OF TECH CAMBRIDGE
(ARL 64-214)
AD-615 904 FLD. 1

•AF33 616 8483
CINCINNATI UNIV OHIO
(ARL 65-15)
AD-615 901 FLD. 1
(ARL 65-18)
F AD-615 933 FLD. 1

•AF33 657 10058
RENSSELAER POLYTECHNIC INST TROY N Y
(ML TR-64-397)
AD-616 291 FLD. 20

•AF33 657 10260
LABORATORIES FOR RESEARCH AND DEVELOPMENT FRANKLIN INST PHILADELPHIA PA
(ARL 65-11)
F AD-616 352 FLD. 11

•AF33 657 10806
LOCKHEED-GEORGIA CO MARIETTA
HUMAN FACTORS RESEARCH LAB
(AMRL TR-65-22)
F AD-615 921 FLD. 5

•AF33 657 10868
INSTITUTE OF RUBBER RESEARCH UNIV OF AKRON OHIO
(ML TDR-64-19 P2)
AD-616 097 FLD. 11

•AF33 657 11043
GENERAL ELECTRIC CO WEST LYNN MASS
(SEG TDR-64-11 P2)
F AD-616 300 FLD. 21

•AF33 657 11238
BENSON (ROBERT W) AND ASSOCIATES INC NASHVILLE TENN
(AMRL TR-65-11)
F AD-615 916 FLD. 6

•AF33 657 11479
WHIRLPOOL CORP ST JOSEPH MICH RESEARCH AND ENGINEERING LABS
(AMRL TR-65-29)
F AD-615 979 FLD. 6

•AF33 657 11738
LITTLE (ARTHUR D) INC CAMBRIDGE MASS
(ARL 65-53)
AD-616 110 FLD. 20

•AF33 657 11737
PURDUE UNIV LAFAYETTE IND
AD-615 848 FLD. 12

•AF33 657 12947
UED EARTH SCIENCES DIV TELEDYNE SYSTEMS CO ALEXANDRIA VA
AD-616 289 FLD. 17

•AF33 657 7380
HEAT TRANSFER LAB UNIV OF MINN MINNEAPOLIS
(ARL 65-68)
AD-615 903 FLD. 20

•AF33 657 7833
MARYLAND UNIV COLLEGE PARK DEPT OF CHEMISTRY
(ARL 65-95)
F AD-615 900 FLD. 7

•AF33 657 8476
PLASMADYNE CORP SANTA ANA CALIF
(ML TDR-64-293)
AD-616 346 FLD. 11

•AF33 657 8867
MICHIGAN UNIV ANN ARBOR
(ARL 65-98)
AD-615 902 FLD. 1

•AF49 638 1030
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV
(AFOSR 65-0988)
F AD-616 336 FLD. 10

•AF49 638 1098
ILLINOIS UNIV URBANA DEPT OF PHYSICS
(AFOSR 65-0772)
AD-616 027 FLD. 20

•AF49 638 1261
HERNER AND CO WASHINGTON D C
(AFOSR 65-0993)
AD-616 179 FLD. 5

•AF49 638 1271 GRANT
GAS DYNAMICS LAB PRINCETON UNIV N J
(AFOSR 65-0645)
AD-616 289 FLD. 1

•AF49 638 1293
RAND CORP SANTA MONICA CALIF
AD-615 947 FLD. 13

•AF49 638 1333
PALMER PHYSICAL LAB PRINCETON UNIV N J
(AFOSR 65-0838)
AD-616 047 FLD. 20

(AFOSR 65-0842)
AD-616 048 FLD. 18

•AF49 638 1337
SEISMOLOGICAL LAB CALIF INST OF TECH PASADENA
AD-616 298 FLD. 8

•AF49 638 1355
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
AD-616 166 FLD. 8
AD-616 167 FLD. 8
AD-616 168 FLD. 8

•AF49 638 1380
HARVARD UNIV CAMBRIDGE MASS
(AFOSR 65-0465)
AD-616 182 FLD. 20

•AF49 638 1389
STANFORD UNIV CALIF
(AFOSR 65-0466)
AD-616 183 FLD. 20

•AF49 638 382
RIAS INC BALTIMORE MD
AD-615 806 FLD. 12

•AF49 638 529
ILLINOIS UNIV URBANA
(AFOSR 65-0767)
AD-616 036 FLD. 20

•AF49 638 541
MELLON INST PITTSBURGH PA
(AFOSR 65-0368)
AD-616 039 FLD. 20

•AF49 638 659
AVCO EVERETT RESEARCH LAB EVERETT MASS
AD-615 888 FLD. 20

•AF49 638 700
RAND CORP SANTA MONICA CALIF
AD-615 946 FLD. 12
AD-615 948 FLD. 15
AD-615 949 FLD. 3
AD-615 950 FLD. 12
AD-616 240 FLD. 9
AD-616 306 FLD. 5

•AF49 638 780
NORTHWESTERN UNIV EVANSTON ILL
(AFOSR 65-0768)
AD-616 045 FLD. 11

•AF49 638 786
YALE UNIV NEW HAVEN CONN
(AFOSR 65-0769)
AD-616 049 FLD. 11

•AF49 638 817
ROCKETDYNE CANOGA PARK CALIF
(AFOSR 64-1952)
AD-615 798 FLD. 21

•AF61 052 481
TECHNION -ISRAEL INST OF TECH HAIFA
(AFOSR 65-0765)
AD-616 038 FLD. 20

•AF61 052 657
INSTITUTO GEOGRAFICO Y CATASTRAL MADRID (SPAIN)
AD-616 016 FLD. 8

•AF61 052 709
BATTELLE MEMORIAL INST GENEVA (SWITZERLAND)
(ARL 65-46)
AD-616 345 FLD. 13

•AF61 052 733
DURHAM UNIV (ENGLAND) DEPT OF GEOLOGY
AD-616 093 FLD. 8

•AF61 514 962
INSTITUT D' ASTROPHYSIQUE COINTE-SCLESSIN (BELGIUM)
(AFCRL 64-88-A)
AD-616 250 FLD. 3
(AFCRL 64-88-C)
AD-616 252 FLD. 3
LIEGE UNIV (BELGIUM)
(AFCRL 64-88 B)
AD-616 251 FLD. 3

•AF628 3869
EMMANUEL COLL BOSTON MASS
RESEARCH LANGUAGE CENTER
(TT 65-62406)
AD-615 957 FLD. 20

•ARDS451
ECLIPSE PIONEER DIV BENDIX CORP TETERBORO N J
(SRDS RD-68-61)
F AD-616 005 FLD. 17

•AT30 1 1480
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
AD-615 837 FLD. 20

•DA ARO D31 124G236
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
(AROD 3473:10)
AD-616 020 FLD. 20

•DA ARO D31 124G26
IOWA STATE UNIV IOWA CITY DEPT OF CHEMISTRY
(AROD 3072:4)
AD-616 023 FLD. 20

•DA ARO D31 124G300
RUTGERS -THE STATE UNIV NEW BRUNSWICK N J COLL OF ENGINEERING
(AROD 3560:6)
AD-616 068 FLD. 20

•DA ARO D31 124G380
COLUMBIA RADIATION LAB NEW YORK
(AFOSR 3922:10)
AD-616 189 FLD. 20
(AROD 3922:11)
AD-616 190 FLD. 20

•DA ARO D31 124G565
NORTH CAROLINA STATE UNIV RALEIGH
(AROD 4105:12)
AD-616 278 FLD. 12

•DA ARO31 124 6537 GRANT
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF AERONAUTICAL ENGINEERING
(AROD 4515:1)
AD-616 067 FLD. 4

•DA ORD26
SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY
(AROD 2785:1)
AD-615 909 FLD. 11

•DA11 ORD022 3108
IIT RESEARCH INST CHICAGO ILL
S AD-616 302 FLD. 11

•DA11 190ENG94
BARODYNAMICS INC GEORGETOWN COLO
(CRREL TR-93)
AD-616 348 FLD. 19

•DA19 066AMC184X
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV
(AMRA CR-63-01/2)
AD-615 817 FLD. 11

•DA19 129QM1487
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
F AD-615 890 FLD. 6

•DA19 129QM1946N
AMERICAN GEOGRAPHICAL SOCIETY NEW YORK
AD-616 257 FLD. 6

•DA28 043AMC00001E
LABORATORY OF CLIMATOLOGY C W THORNTHWAITE ASSOCIATES CENTERTON N J
F AD-616 355 FLD. 4
F AD-616 396 FLD. 4

•DA28 043AMC00109E
TEXAS INSTRUMENTS INC DALLAS
AD-616 331 FLD. 9

•DA28 043AMC00478E
MOTOROLA INC CHICAGO ILL COMMUNICATIONS DIV
AD-615 975 FLD. 17

•DA31 124ARO D114
ILLINOIS UNIV URBANA DEPT OF PHYSICS
(AROD 431:68)
AD-616 090 FLD. 20

•DA31 124ARO D33
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
AD-616 176 FLD. 9

•DA31 124AROD38
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
(AROD 3899:4)
AD-616 074 FLD. 7

•DA36 039AMA03200E
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-615 847 FLD. 5

•DA36 039AMC00161E
IBM SPACE GUIDANCE CENTER OWEGO N Y
F AD-616 007 FLD. 9

•DA36 039AMC01479E
ERIE TECHNOLOGICAL PRODUCTS INC PA
AD-615 826 FLD. 9

•DA36 039AMC02173E
EAGLE-PICHER CO JOPLIN MO
F AD-615 973 FLD. 10

•DA36 039AMC02239E
LOWELL TECHNOLOGICAL INST RESEARCH FOUNDATION MASS
AD-615 810 FLD. 20

•DA36 039AMC02280E
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
AD-615 960 FLD. 20

•DA36 039AMC02324E
TEXAS INSTRUMENTS INC DALLAS
AD-615 808 FLD. 9

•DA36 039AMC03200E
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-616 092 FLD. 20
AD-616 162 FLD. 21

•DA36 039AMC03200E GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-616 091 FLD. 9
AD-616 334 FLD. 5

•DA36 039AMC03201E
ROCKETDYNE CANOGA PARK CALIF
(ECOM 03201-6)
AD-616 385 FLD. 10

•DA36 039AMC03229E
BOMAC DIV VARIAN ASSOCIATES BEVERLY MASS
F AD-616 274 FLD. 9

•DA36 039AMC03623E
MALLORY (P R) AND CO INC INDIANAPOLIS IND
AD-616 299 FLD. 9

•DA36 039AMC03624E
LINDE DIV UNION CARBIDE CORP CLEVELAND OHIO
AD-615 958 FLD. 9

•DA36 039SC30290
CLEVITE CORP CLEVELAND OHIO
F AD-615 896 FLD. 13
F AD-615 897 FLD. 13

•DA36 039SC81274
KNIGHTS (JAMES) CO SANDWICH ILL
AD-616 388 FLD. 9

•DA36 039SC85325
WESTERN ELECTRIC CO INC NEW YORK
AD-615 891 FLD. 9

•DA36 039SC85955
CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO NORWOOD MASS
F AD-615 899 FLD. 9

•DA36 039SC85972
VALPEY FISHER CORP HOLLISTON MASS
AD-616 256 FLD. 9

•DA36 039SC86733E
TRW SEMICONDUCTORS INC LAWNDALE CALIF
AD-615 898 FLD. 9

•DA36 039SC87222
BROWN UNIV PROVIDENCE R I
AD-616 324 FLD. 12

•DA36 039SC87280
ILLINOIS STATE WATER SURVEY URBANA
F AD-615 772 FLD. 4

•DA36 039SC88961
INTERNATIONAL RESISTANCE CO PHILADELPHIA PA DOCUMENTED RELIABILITY DIV
F AD-615 977 FLD. 9

•DA44 009ENG4909
GENERAL ELECTRIC CO WEST LYNN MASS
AD-615 885 FLD. 10

•DA44 177AMC105T
KAMAN AIRCRAFT CORP BLOOMFIELD CONN
(TRECOM TR-65-14)
F AD-616 104 FLD. 1

•DA44 177AMC143T
GOODYEAR AEROSPACE CORP AKRON OHIO
(USAAML TR-65-19)
AD-616 105 FLD. 1

•DA44 177AMC22T
AEROELASTIC AND STRUCTURES RESEARCH LAB MASS INST OF TECH CAMBRIDGE
(USAAML TR-65-13)
F AD-615 922 FLD. 1

•DA44 177AMC238T
PAYNE (PETER R) INC ROCKVILLE MD
(USAAML TR-65-20)
F AD-616 357 FLD. 1
(USAAML TR-65-20)
AD-616 395 FLD. 1

•DA44 177AMC72T
GENERAL ELECTRIC CO CINCINNATI OHIO ADVANCED ENGINE AND TECHNOLOGY DEPT
(TRECOM TR-65-4)
F AD-616 267 FLD. 1

•DA44 177AMC868T
RYAN AERONAUTICAL CO SAN DIEGO CALIF
(TRECOM TR-65-11)
F AD-615 908 FLD. 1

•DA44 177AMC892T
MISSISSIPPI STATE UNIV STATE COLLEGE
(TRECOM TR-65-16)
AD-615 928 FLD. 1

•DA49 007MD275 GRANT
PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
AD-616 177 FLD. 6

•DA49 146XZ200
VARIAN ASSOCIATES PALO ALTO CALIF
(DASA 1523)
F AD-615 915 FLD. 18

•DA49 146XZ205
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
AD-616 179 FLD. 4

•DA49 193MD2082 GRANT
TUFTS UNIV BOSTON MASS SCHOOL OF MEDICINE
AD-616 069 FLD. 6

•DA49 193MD2171
PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
AD-616 178 FLD. 6

•DA49 193MD2171 GRANT
PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
AD-616 180 FLD. 6

•DA49 193MD2238
MARYLAND UNIV COLLEGE PARK
(TT 65-62422)
AD-616 003 FLD. 6

•DA49 193MD2371
NORTH CAROLINA UNIV CHAPEL HILL SCHOOL OF MEDICINE
AD-616 181 FLD. 6

•DA49 193MD2604
HOOD COLL FREDERICK MD
AD-616 198 FLD. 6

•DRB9210 96
DALHOUSIE UNIV HALIFAX (NOVA SCOTIA)
AD-615 843 FLD. 6

•FAA/BRD229
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
AD-615 818 FLD. 1

•GRANT NSF GI9272
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE
AD-616 201 FLD. 6

•H2940
PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
AD-616 177 FLD. 6

•MIPR33 687 3R/D360
PICATINNY ARSENAL DOVER N J ENGINEERING SCIENCES LAB
(FDL TDR-64-69)
AD-616 330 FLD. 19

•NASA NGR05 002 028
CALIFORNIA INST OF TECH PASADENA
AD-616 191 FLD. 3

•NASR103
RIAS INC BALTIMORE MD
AD-615 806 FLD. 12

•NASS 3111
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
AD-616 179 FLD. 4

•NIH AM07919
WASHINGTON UNIV SEATTLE
AD-616 226 FLD. 6

•NIH AT06281
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AD-615 835 FLD. 6

•NIH A4486
TUFTS UNIV BOSTON MASS SCHOOL OF MEDICINE
AD-616 069 FLD. 6

•NIH ME05969 0251
PRESBYTERIAN-ST LUKE'S HOSPITAL CHICAGO ILL
AD-616 180 FLD. 6

•NOBSR72627
DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN
AD-615 830 FLD. 17
AD-616 060 FLD. 20

•NOBSR87522
ROTRON MFG CO WOODSTOCK N Y
AD-615 820 FLD. 13

•NOBSR93140
TRACOR INC AUSTIN TEX
AD-615 914 FLD. 13

•NOBS90267
AMERICAN OIL CO WHITING IND
F AD-616 096 FLD. 11

•NOBS90268
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN
F AD-615 774 FLD. 11

•NONR N62558 3073
COPENHAGEN UNIV (DENMARK)
AD-615 797 FLD. 13

•NONR 339500
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN
AD-615 819 FLD. 7

•NONR 40147
CORNELL UNIV ITHACA N Y
AD-616 082 FLD. 20

•NONR114114
EMORY UNIV ATLANTA GA
AD-616 279 FLD. 5

•NONR122434
MICHIGAN UNIV ANN ARBOR
AD-616 233 FLD. 5

•NONR136700
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
F AD-615 877 FLD. 8

•NONR150906
IOWA STATE UNIV IOWA CITY
AD-616 234 FLD. 20

•NONR157503
COASTAL STUDIES INST LOUISIANA STATE UNIV BATON ROUGE
AD-616 141 FLD. 8
AD-616 231 FLD. 8

•NONR183436
GROUP EFFECTIVENESS RESEARCH LAB UNIV OF ILLINOIS URBANA
AD-616 327 FLD. 5

•NONR184148
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
AD-616 277 FLD. 11

•NONR185816
PRINCETON UNIV N J
AD-616 290 FLD. 5
AD-616 319 FLD. 5

•NONR186632 GRANT
CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
AD-615 803 FLD. 9

•NONR188300
TEXACO EXPERIMENT INC RICHMOND VA
AD-616 230 FLD. 20

•NONR21194
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
AD-616 276 FLD. 8

•NONR212126
CHICAGO UNIV ILL FLUID DYNAMICS AND SEDIMENT TRANSPORT LAB
AD-615 787 FLD. 8

•NONR219600
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-615 878 FLD. 8

•NONR22097 GRANT
CALIFORNIA INST OF TECH PASADENA
AD-616 191 FLD. 3

•NONR221605
MARINE PHYSICAL LAB UNIV OF CALIFORNIA SAN DIEGO
AD-615 882 FLD. 13
AD-615 886 FLD. 13

•NONR221611
CALIFORNIA UNIV LA JOLLA
AD-615 799 FLD. 20

•NONR221623
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-615 845 FLD. 8

•NONR22294
CALIFORNIA UNIV BERKELEY
AD-616 076 FLD. 20
AD-616 077 FLD. 20
AD-616 078 FLD. 20

•NONR22253
ELECTRONICS RESEARCH LAB UNIV OF CALIFORNIA BERKELEY
AD-616 144 FLD. 9

•NONR22283 GRANT
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
AD-615 815 FLD. 12

•NONR22289
SPACE SCIENCES LAB UNIV OF CALIFORNIA BERKELEY
AD-616 259 FLD. 8

•NONR22560
STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE
AD-615 926 FLD. 11
AD-615 927 FLD. 11

•NONR22962
STANFORD UNIV CALIF GRADUATE SCHOOL OF BUSINESS
AD-616 293 FLD. 5

•NONR22967
HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF
AD-616 012 FLD. 20
AD-616 193 FLD. 20

•NONR22974
STANFORD UNIV CALIF
AD-616 095 FLD. 20

•NONR228503
DELAWARE UNIV NEWARK
AD-616 083 FLD. 20

•NONR23954
CALIFORNIA UNIV LOS ANGELES DEPT OF PSYCHOLOGY
AD-616 269 FLD. 5

•NONR24860
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE
AD-616 201 FLD. 6

•NONR26348
STEVENS INST OF TECH HOBOKEN N J
AD-615 852 FLD. 11

•NONR26655
COLUMBIA UNIV NEW YORK SCHOOL OF ENGINEERING AND APPLIED SCIENCE
AD-616 111 FLD. 13

•NONR26673 GRANT
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-616 081 FLD. 6

•NONR275401
NEW YORK MEDICAL COLL N Y
AD-616 085 FLD. 6

•NONR28538
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
AD-616 194 FLD. 12

•NONR28542
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
AD-615 837 FLD. 20

•NONR28558
NEW YORK UNIV N Y DEPT OF PHYSICS
AD-615 978 FLD. 20

•NONR297500
ROSWELL PARK MEMORIAL INST BUFFALO N Y
AD-616 062 FLD. 7
AD-616 063 FLD. 20

•NONR300202
PACIFIC MARINE STATION DILLON BEACH CALIF
AD-615 788 FLD. 14

•NONR343600
INSTITUTE OF BEHAVIORAL RESEARCH TEXAS CHRISTIAN UNIV FORT WORTH
AD-615 762 FLD. 5
AD-615 765 FLD. 5

•NONR347500
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y
F AD-616 272 FLD. 20

•NONR365612
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AD-616 228 FLD. 6

•NONR365612 GRANT
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AD-615 835 FLD. 6

•NONR370600
MARTIN CO ORLANDO FLA
AD-615 917 FLD. 11

•NONR373100
MECHANICAL TECHNOLOGY INC LATHAM N Y
AD-616 084 FLD. 20

•NONR373200
CENTER FOR NAVAL ANALYSES FRANKLIN INST PHILADELPHIA PA
F AD-616 359 FLD. 13

•NONR374803
HAWAII INST OF GEOPHYSICS HONOLULU
AD-616 004 FLD. 9

•NONR381000
TEXAS INSTRUMENTS INC DALLAS
AD-616 115 FLD. 11

•NONR390200
GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF
AD-616 089 FLD. 20

•NONR398504
TRAINING RESEARCH LAB UNIV OF ILLINOIS RBANA
AD-616 296 FLD. 5

•NONR40137
CORNELL UNIV ITHACA N Y
AD-615 776 FLD. 18

•NONR40138
CORNELL UNIV ITHACA N Y (NYO 2391-2)
AD-615 849 FLD. 20
AD-615 850 FLD. 20
AD-616 088 FLD. 20

•NONR402900
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-615 878 FLD. 8

•NONR402900 GRANT
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-616 087 FLD. 8
S AD-616 392 FLD. 8

•NONR40410
RUTGERS -THE STATE UNIV NEW BRUNSWICK N J
AD-615 796 FLD. 5
AD-616 196 FLD. 5

•NONR406300
NORTH AMERICAN AVIATION SCIENCE CENTER THOUSAND OAKS CALIF
F AD-615 974 FLD. 20

•NONR410400
ALLISON DIV GENERAL MOTORS CORP INDIANAPOLIS IND
AD-616 260 FLD. 9

•NONR410700
DECO ELECTRONICS INC BOULDER COLO
AD-615 923 FLD. 4

•NONR411500
LINDE DIV UNION CARBIDE CORP TONAWANDA N Y
AD-615 814 FLD. 6

•NONR422201
CALIFORNIA UNIV SANTA BARBARA
AD-616 075 FLD. 14
AD-616 227 FLD. 3

•NONR424500
LITTON SYSTEMS INC WASHINGTON

D C APPLIED SCIENCE DIV
AD-615 913 FLD. 15

•NONR437400
NEW YORK STATE UNIV BUFFALO
AD-615 766 FLD. 5

•NONR438100
SPACE-GENERAL CORP EL MONTE CALIF
AD-615 959 FLD. 7

•NONR453500
MECHANICAL TECHNOLOGY INC LATHAM N Y
AD-615 919 FLD. 13
AD-615 920 FLD. 13

•NONR481400
LITTON SYSTEMS INC WASHINGTON D C APPLIED SCIENCE DIV
AD-615 913 FLD. 15

•NONR490500
ARCON CORP LEXINGTON MASS
AD-616 390 FLD. 12

•NONR49205
EMORY UNIV ATLANTA GA
AD-616 279 FLD. 5

•NONR96227
METALS RESEARCH LAB BROWN UNIV PROVIDENCE R I
AD-616 258 FLD. 20

•NONR71060
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF PHYSICS
AD-616 297 FLD. 18

•NONR76024
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
AD-616 112 FLD. 13
AD-616 113 FLD. 12

•NONR76109
GEORGE WASHINGTON UNIV WASHINGTON D C SCHOOL OF ENGINEERING AND APPLIED SCIENCE
AD-616 387 FLD. 20

•NORD16997
ORDNANCE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
AD-615 777 FLD. 20

•NOW 63 0209C
ORDNANCE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
AD-615 777 FLD. 20

•NOW63 0090
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
AD-616 239 FLD. 9

•NOW64 0170C
ALCOA RESEARCH LABS ALUMINUM CO OF AMERICA NEW KENSINGTON PA
F AD-615 789 FLD. 11

•NOW64 0279D
SYRACUSE UNIV N Y RESEARCH INST
F AD-615 786 FLD. 11

•NOW65 0131D
NEW YORK STATE COLL OF CERAMICS ALFRED UNIV
AD-615 809 FLD. 11

•NSF B22296
WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS
(AFOSR 65-0811)
AD-616 219 FLD. 20

•NSF GB2500
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
AD-616 169 FLD. 6

•NSF GB879
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-616 081 FLD. 6

•NSF GK59
GAS DYNAMICS LAB PRINCETON UNIV N J
(AFOSR 65-0645)
AD-616 285 FLD. 1

•NSF GP2370
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-616 087 FLD. 8
S AD-616 392 FLD. 8

•NSF GP2498
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-616 091 FLD. 9
AD-616 334 FLD. 5

•NSF GP2633
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
AD-615 815 FLD. 12

•NSF GP2914
IONOSPHERE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AFCRL 65-191)
AD-615 970 FLD. 4

•NSF GP303
CALIFORNIA INST OF TECH. PASADENA
AD-616 186 FLD. 1

•NSF GP438
COLUMBIA RADIATION LAB NEW YORK
(AFOSR 3922:10)
AD-616 189 FLD. 20
(AROD 3922:11)
AD-616 190 FLD. 20

•NSF GP891
CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
AD-615 803 FLD. 9

•NSF G16034
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
(AFCRL 65-147)
AD-615 834 FLD. 8

•NSF G19010
COLUMBIA UNIV NEW YORK
(AFOSR 65-0783)
AD-616 219 FLD. 20

•NSF G6089
IOWA STATE UNIV IOWA CITY DEPT OF CHEMISTRY
(AROD 3072:4)
AD-616 033 FLD. 20

•NSG133 61
STANFORD UNIV CALIF
AD-616 185 FLD. 22

•NSG134 61
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF AERONAUTICAL ENGINEERING
(AROD 4915:1)
AD-616 067 FLD. 4

•NSG233 62
IOWA STATE UNIV IOWA CITY
AD-616 172 FLD. 4

•NSG269 62
GRADUATE RESEARCH CENTER OF THE SOUTHWEST DALLAS TEX
AD-616 343 FLD. 20

•N61339 1297
TRG INC MELVILLE N Y
F AD-615 907 FLD. 5

•N62558 3591
BATTERSEA COLL OF TECH LONDON (ENGLAND)
AD-616 273 FLD. 13

•N9ONR93803 GRANT
IOWA STATE UNIV IOWA CITY
AD-616 172 FLD. 4

•OCD OS63 134
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND POLITICAL STUDIES DIV
AD-615 779 FLD. 15

•OCD PS64 12
GAUTNEY AND JONES WASHINGTON D C
F AD-615 911 FLD. 15

•PHS 2A89289C2
TEMPLE UNIV PHILADELPHIA PA SCHOOL OF MEDICINE
AD-616 029 FLD. 6

AD-DIVISION INDEX

The fields indicated here apply only to the Techical Abstract Bulletin Section (on white paper).

615 762	5
615 763	9
615 764	20
615 765	5
615 766	5
615 767	9
615 768	4
615 769	14
615 770	20
615 771	13
615 772	4
615 773	17
615 774	11
615 775	6
615 776	18
615 777	20
615 778	9
615 779	15
615 780	20
615 781	11
615 782	21
615 784	13
615 785	20
615 786	11
615 787	8
615 788	14
615 789	11
615 790	6
615 791	13
615 792	14
615 793	14
615 794	20
615 795	13
615 796	5
615 797	13
615 798	21
615 799	20
615 800	5
615 801	20
615 802	14
615 803	9
615 804	20
615 806	12
615 807	11
615 808	9
615 809	11
615 810	20
615 811	9
615 812	1
615 813	5
615 814	6
615 815	12
615 816	21
615 817	11
615 818	1
615 819	7
615 820	13
615 821	12
615 822	20
615 823	11
615 824	9
615 825	7
615 826	9
615 827	9
615 828	15
615 829	9
615 830	17
615 831	14
615 833	8
615 834	8
615 835	6
615 836	6
615 837	20
615 838	8
615 839	8
615 840	8
615 841	8
615 842	8
615 843	6
615 844	15
615 845	8
615 847	8
615 848	12
615 849	20
615 850	20
615 851	6
615 852	11
615 853	13
615 854	22
615 855	22
615 856	22
615 857	22
615 858	22
615 859	22
615 860	22
615 861	22
615 862	17
615 863	22
615 864	20
615 865	11
615 866	14
615 867	8
615 868	9
615 869	14
615 870	7
615 871	20
615 872	20
615 873	6
615 874	16
615 875	20
615 876	11
615 877	8
615 878	8
615 879	5
615 880	13
615 881	13
615 882	13
615 883	13
615 884	5
615 885	10
615 886	13
615 887	5
615 888	20
615 889	20
615 890	6
615 891	9
615 892	15
615 893	1
615 894	16
615 895	19
615 896	13
615 897	13
615 898	9
615 899	9
615 900	7
615 901	1
615 902	1
615 903	20
615 904	1
615 905	17
615 906	20
615 907	5
615 908	1
615 909	11
615 910	5
615 911	15
615 912	14
615 913	15
615 914	13
615 915	18
615 916	6
615 917	11
615 918	17
615 919	13
615 920	13
615 921	5
615 922	1
615 923	4
615 924	4
615 925	22
615 926	11
615 927	11
615 928	1
615 929	6
615 930	20
615 931	21
615 932	7
615 933	1
615 934	6
615 935	14
615 936	20
615 937	20
615 938	20
615 939	9
615 940	9
615 941	11
615 942	5
615 943	9
615 944	1
615 945	13
615 946	12
615 947	13
615 948	15
615 949	3
615 950	12
615 951	14
615 952	1
615 953	17
615 954	17
615 955	7
615 956	4
615 957	20
615 958	9
615 959	7
615 960	20
615 961	9
615 962	9
615 963	9
615 964	9
615 965	9
615 966	7
615 967	6
615 968	13
615 969	4
615 970	4
615 971	20
615 972	4
615 973	10
615 974	20
615 975	17
615 976	20
615 977	9
615 978	20
615 979	6
615 980	17
615 981	17
615 982	11
615 983	7
615 984	19
615 985	21
615 986	22
615 987	20
615 988	14
615 989	7
615 990	20
615 991	7
615 992	14
615 993	1
615 994	13
615 995	5
615 996	13
615 997	14
615 998	8
615 999	20
616 000	9
616 001	9
616 002	20
616 003	6
616 004	9
616 005	17
616 006	17
616 007	9
616 008	4
616 011	7
616 012	20
616 013	18
616 014	6
616 015	20
616 016	8
616 017	12
616 018	20
616 019	8
616 020	20
616 021	14
616 022	20
616 023	20
616 024	6
616 025	6
616 026	6
616 027	6
616 028	5
616 029	6
616 030	6
616 031	20
616 032	20
616 033	20
616 034	13
616 035	13
616 036	20
616 037	20
616 038	20
616 039	20
616 041	8
616 042	20
616 043	20
616 044	20

616 045	11
616 046	11
616 047	20
616 048	18
616 049	11
616 050	20
616 051	20
616 052	20
616 053	20
616 054	11
616 055	20
616 056	20
616 057	20
616 058	20
616 059	20
616 060	20
616 061	20
616 062	7
616 063	20
616 065	17
616 066	14
616 067	4
616 068	20
616 069	6
616 071	7
616 072	6
616 073	6
616 074	7
616 075	14
616 076	20
616 077	20
616 078	20
616 079	20
616 080	20
616 081	6
616 082	20
616 083	20
616 084	20
616 085	6
616 087	8
616 088	20
616 089	20
616 090	20
616 091	9
616 092	20
616 093	8
616 094	4
616 095	20
616 096	11
616 097	11
616 098	21
616 099	20
616 100	9
616 101	11
616 102	1
616 103	4
616 104	1
616 105	1
616 106	9
616 107	4
616 108	10
616 109	1
616 110	20
616 111	13
616 112	13
616 113	12
616 114	8
616 115	11
616 116	7
616 117	9
616 118	22
616 119	13
616 120	10
616 121	14
616 122	12
616 123	9
616 124	4
616 125	9
616 126	14
616 127	5
616 128	1
616 129	21
616 130	20
616 131	20
616 132	9
616 133	14
616 134	6
616 135	6
616 136	6
616 137	6
616 138	6
616 139	6
616 140	4
616 141	8
616 142	20
616 143	21
616 144	9
616 145	14
616 146	20
616 147	20
616 148	5
616 149	9
616 150	20
616 151	14
616 152	5
616 153	5
616 154	19
616 155	6
616 156	22
616 157	20
616 158	6
616 159	6
616 160	8
616 161	20
616 162	21
616 163	20
616 164	6
616 165	6
616 166	8
616 167	8
616 168	8
616 169	6
616 170	6
616 171	9
616 172	4
616 173	20
616 174	20
616 175	5
616 176	9
616 177	6
616 178	6
616 179	4
616 180	6
616 181	6
616 182	20
616 183	20
616 184	20
616 185	22
616 186	1
616 187	7
616 188	7
616 189	20
616 190	20
616 191	3
616 193	20
616 194	12
616 195	3
616 196	5
616 198	6
616 199	20
616 200	20
616 201	6
616 202	20
616 203	20
616 204	1
616 205	20
616 206	20
616 207	20
616 208	14
616 209	20
616 210	20
616 211	7
616 212	20
616 213	20
616 214	20
616 215	20
616 216	20
616 217	20
616 218	20
616 219	20
616 220	20
616 221	20
616 222	14
616 223	20
616 224	20
616 225	20
616 226	6
616 227	3
616 228	6
616 230	20
616 231	8
616 233	5
616 234	20
616 235	9
616 236	1
616 237	13
616 238	7
616 239	9
616 240	9
616 241	13
616 242	20
616 243	8
616 244	3
616 245	18
616 246	20
616 247	18
616 248	18
616 249	1
616 250	3
616 251	3
616 252	3
616 253	4
616 254	8
616 255	17
616 256	9
616 257	6
616 258	20
616 259	8
616 260	9
616 261	8
616 262	8
616 263	11
616 264	9
616 265	5
616 266	9
616 267	1
616 268	17
616 269	9
616 270	14
616 271	20
616 272	20
616 273	13
616 274	9
616 275	17
616 276	8
616 277	11
616 278	12
616 279	5
616 280	6
616 281	13
616 282	22
616 283	11
616 284	13
616 285	1
616 286	13
616 287	8
616 288	8
616 290	5
616 291	20
616 292	5
616 293	5
616 294	5
616 295	4
616 296	5
616 297	18
616 298	8
616 299	9
616 300	21
616 301	12
616 302	11
616 303	8
616 304	19
616 305	5
616 306	5
616 307	22
616 308	11
616 309	9
616 310	20
616 311	4
616 312	21
616 313	13
616 314	13
616 315	20
616 316	6
616 317	21
616 318	4
616 319	5
616 320	4
616 321	1
616 322	11
616 323	5
616 324	12
616 325	9
616 326	5
616 327	5
616 328	14

616 329	9
616 330	19
616 331	9
616 334	5
616 335	7
616 336	10
616 337	7
616 338	20
616 339	5
616 340	14
616 341	20
616 342	5
616 343	20
616 344	11
616 345	13
616 346	11
616 347	4
616 348	19
616 349	4
616 350	20
616 351	4
616 352	11
616 353	20
616 354	20
616 355	4
616 356	9
616 357	1
616 358	8
616 359	13
616 360	4
616 361	21
616 362	6
616 363	8

616 364	6
616 365	15
616 366	9
616 367	15
616 368	5
616 369	12
616 370	12
616 371	12
616 372	6
616 373	12
616 374	4
616 375	9
616 376	9
616 377	12
616 378	15
616 379	4
616 380	15
616 381	12
616 382	8
616 383	16
616 384	4
616 385	10
616 386	4
616 387	20
616 388	9
616 389	11
616 390	12
616 391	11
616 392	8
616 393	6
616 394	4
616 395	1
616 396	4

616 397	8
616 398	20
616 399	8
616 400	1
616 401	12
616 402	22
616 403	20
616 404	5
616 405	16
616 406	5
616 407	22
616 408	12
616 409	4
616 410	12
616 411	5
616 412	5
616 413	15
616 414	5
616 415	14
616 416	20
616 417	5
616 418	8
616 419	22
616 420	17
616 421	8
616 422	22
616 423	13
616 424	5
616 425	19
616 426	15
616 427	12
616 428	5
616 429	5
616 430	5

OTHER RESEARCH REPORTS AND RELATED MATERIAL

*Descriptors marked with an asterisk are included in the subject index

01. Aeronautics

Patent 3,170,358 Field 1C, 1E

SELF-BRAKING SWIVEL FOR AIRCRAFT ARRESTING UNITS WITH CROSS RUNWAY ARREST CABLES.
Patent assigned to FAA,
by William R. Schlegel.
20 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Arresting gear, Aircraft), Ball bearings, Rotation, Brakes, Runways, Cables(Mechanical), Patents.

The self-braking ball bearing swivel is utilized with aircraft arresting gear with a cross runway arrest cable. The swivel structure includes a short swaged integral end fitting, whereby the swivel possesses lower total mass and length than in standard swivels having long swaged eye terminals, such lower mass and length resulting in lower swivel terminal loading resulting from kink waves in aircraft runway cross cables. The swivel is free to be accelerated in rotation upon arrival of a kink wave at each of the runway cross cable swivels to align with each respective kink wave angle prior to the self-braking action of the swivel.

Patent 3,179,360 Field 1B

INFLATABLE PERSONNEL RESTRAINT SYSTEM FOR ADVANCED FLIGHT VEHICLES.
Patent assigned to Air Force,
by Sid W. Shelton and Richard L. Crossman.
20 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Safety harness, Aerospace craft), (*Aerospace craft, Safety harness), Astronauts, Pilots, Aviation safety, Inflatable structures, Patents.

The system includes an integrated restraint and supplementary body support system which is pneumatically operated both by manual and automatic controls and is capable of continuous and repetitive operation as required. Two Airmat pads, filled with polyether foam, serve as the supplementary body support system, and in the deflated condition the seating characteristics are maintained by the polyether foam. When pressurized, the rigidizing characteristics of the material are utilized.

Patent 3,180,082 Field 1C, 19A

CANOPY UNLOCK THRUSTER.
Patent assigned to Army,
by Albert Benditt and Charles S. Sterrett.
27 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Aircraft canopies, Cartridges(Pad)), Safety devices, Thrust, Ejection, Patents.

The propellant actuated thruster is used in an aircraft emergency system for unlocking and opening an aircraft canopy. The arrangement of parts includes a unique relation between the piston, the piston rod and the cylinder. The piston and rod are hollow and the rod is perforated at a predetermined distance from the forward face of the piston.

PB-167 463 Field 1E
CFSTI Prices: HC$1.00 MF$0.50

Wright Air Development Center, Wright-Patterson AFB, Ohio.
EVALUATION OF RUNWAY DISTANCE MARKERS,
by Clayton S. Hoffman. Oct 55, 23p
Technical note no. WADC TN-55-588
AD 80 489
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Runways, Visual signals), (*Visual signals, Effectiveness), Visibility, Visual perception, Paints, Construction, Colors.

The runway distance markers are intended to aid the pilot in checking the performance of certain type aircraft by indicating to him either the distance of runway remaining or the distance used. Object of the evaluation was to determine the effectiveness of this type marker.

PB-167 496 Field 1E, 4B
CFSTI Prices: HC$2.00 MF$0.50

Travelers Research Center, Inc., Hartford, Conn.
FURTHER STUDIES OF SPACE AND TIME VARIATIONS IN ATMOSPHERIC TRANSMISSION ALONG AIRPORT RUNWAYS,
by Keith D. Hage and Herbert D. Entrekin. Mar 65, 36p Technical rept. nos. TR-3, 7468-143
Contracts FA65WA1192, Cwb10704, Proj. 150 535 02A
SRDS RD-65-6
Unclassified report

Descriptors: (*Runways, Visibility), (*Atmosphere, Light transmission), (*Visibility, Runways), Airports, Atmospheric precipitation, Fog, Time, Analysis of variance, Visual perception.

Space and time variations of transmission of visible light in the atmosphere during fog and precipitation are examined in detail as a preliminary step in the development of suitable short-period prediction techniques to be used at aviation terminals. The study is based primarily on data from three transmissometers along runways at John F. Kennedy International Airport, New York. The relative space scales of various classes of obstructions-to-vision are estimated and compared with similar estimates based on data from the National Aviation Facilities Experimental Center at Atlantic City, N. J. The apparent movement of the transmission field is derived and is related, insofar as possible, to advective and warm frontal movements. The potential predictability of linear translation of the

transmission field is evaluated for periods of 5 to 25 minutes. Conditional frequencies of runway visual range for selected space and time lags are presented and compared with those found for Atlantic City Airport. (Author)

PB-167 551 Field 1B
CFSTI Prices: HC$1.00 MF$0.50

Civil Aeromedical Research Inst., Oklahoma City, Okla.
HUMAN FACTORS OF EMERGENCY EVACUATION,
by Stanley R. Mohler, John J. Swearingen, Ernest B. McFadden, and J. D. Garner. Sep 64, 20p
AM 65-7; AD 459 638
Unclassified report

Descriptors: (*Aviation accidents, Survival), (*Abandonment, Aviation accidents), Aviation safety, Aircraft, Jet planes, Transport planes, Design, Ditching, Human engineering, Aviation personnel, Training.

A summary of the evacuation experience since World War II in civil tests and actual civilian airliner accidents is presented. Results of recently conducted aeromedical research into means of affording the more rapid evacuation of high density piston and jet passenger aircraft are given. Recommendations are made relative to air crew training programs and future aircraft design considerations. (Author)

02. Agriculture

Patent 3,180,340 Div. 2A

TURKISH TOBACCO SUBSTITUTE FOR SMOKING TOBACCO.
Patent assigned to Agriculture,
by Russell L. Stedman and Charles D. Stills. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Plants(Botany), Processing), Agriculture, Chemical compounds, Mixtures, Patents.

The tobacco composition has the characteristics of a blend containing Turkish tobacco. It consists of a blend of domestic tobacco and small amounts of isovaleric acid and beta-methyl-valeric acid.

03. Astronomy and Astrophysics

No entries

04. Atmospheric Sciences

PB-167 511 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania State Univ., University Park. Mineral Industries Experiment Station.
SYNOPTIC APPLICATIONS OF WINDOW RADIATION FROM TIROS III.
Final rept.,
by Mae D. Lethbridge, Kong-Sam Pak, and H. A. Panofsky. 31 Dec 64, 21p
Grant WBG14
Unclassified report

Descriptors: (*Meteorological parameters, Scientific research), (*Atmospheric precipitation, Analysis of variance), Cloud cover, Weather forecasting, Blackbody radiation, Meteorological satellites, Atlantic Ocean, Temperature, Climatology.

The report summarizes synoptic applications of a quantity DV, defined as the difference between effective radiating window temperature and the surface temperature, which, over the oceans, can sufficiently well be determined from climatic charts. During three summer periods over the Atlantic, DV is well correlated with vorticity advection, but not with meridional motion or temperature advection. Vertical motion was not available for testing. Over land, in a summer period, vertical velocity was obtained by a crude form of the kinematic technique and produced patterns which were related to patterns of DV. Finally, for a summer period and two spring periods, DV over the U. S. was compared with precipitation. Large 12-hour precipitation amounts occurred only with large DV, but zero precipitation could occur with any DV. In the summer, DV has little advantage over radiation temperature itself. (Author)

PB-167 545 Field 4A
CFSTI Prices: HC$3.00 MF$0.50

Research and Advanced Development Div., AVCO Corp., Wilmington, Mass.
FREQUENCY OF SPREAD-F OCCURRENCE OVER ANTARCTICA.
Antarctic research and data analysis scientific rept. no. 20,
by Rudolf Penndorf. 25 Mar 65, 52p
Technical rept. no. RAD-TR-65-1
Contract NSF C255
Unclassified report

Descriptors: (*Ionosphere, Polar regions), (*Polar regions, Ionosphere), (*Ionospheric propagation, Radio waves), Diurnal variations, Electron density, Atmospheric sounding, Arctic regions, Aurorae.

The frequency of occurrence of spread F in the Antarctic was studied during the IGY period. Data from eight stations were used to investigate the diurnal, seasonal, and geographic variations. Data from 22 stations south of 30 degrees geographic latitude were used to describe average seasonal conditions over the Antarctic. The results have been compared with those for the Arctic, and it was found that the conditions in both polar regions seem to differ in some respects, although the basic features are very similar. The area around the magnetic poles experiences the highest frequency of spread-F occurrences (at least 60 percent at any time throughout the year) with no appreciable diurnal variation during the winter. This 'permanent maximum' is centered over Wilkes Land inside the auroral zone and shows very little change with season. Over the polar cap no diurnal variation is experienced during the winter; however, at the auroral zone and outside of it, a diurnal variation is noticed. During the summer and equinoxes all stations undergo diurnal variations although those situated in the permanent maximum experience a diurnal variation of only 30 percent. A 'traveling maximum,' moving along the midnight meridian at the auroral zone and through the dip pole area is established by the synoptic-map technique. The inner Antarctic seems to experience more spread F than the conjugate area in the Arctic. (Author)

PB-167 548 Field 4B
CFSTI Prices: HC$2.00 MF$0.50

Geophysics Corp. of America, Bedford, Mass.
METEOROLOGICAL INFERENCES FROM RADIANCE MEASUREMENTS.
Final rept.,
by Jean I. F. King. Mar 65, 40p
Technical rept. no. GCA-TR-65-6-G
Contract Cwb10883 Unclassified report

Descriptors: (*Meteorological parameters, Electromagnetic waves), Atmospheric temperature, Lapse rate, Stratosphere, Troposphere, Tropopause, Temperature inversion.

The atmospheric thermal profile was deduced from radiance data. It is shown that it is possible to infer atmospheric temperature structure from multichannel radiance data of two to three decimal accuracy, and that the nonlinear inversion algorithm applied without prior smoothing to noisy data produces the maximum allowable inferences consistent with the accuracy of the data. From radiance data can be inferred stratosphere lapse-rate, tropopause pressure and temperature, tropospere lapse-rate, lower bound (cloud or surface) pressure and temperature.

PB-167 549 Field 4B, 22B
CFSTI Prices: HC$6.00 MF$1.25

Michigan Univ., Ann Arbor. Coll. of Engineering.
QUANTITATIVE INTERPRETATION OF LOW-LEVEL CUMULIFORM CLOUD PATTERNS AS SEEN ON METEOROLOGICAL SATELLITE VIDEOGRAPHS.
Technical rept; Doctoral thesis,
by John A. Leese. Jul 64, 219p
Rept. no. 06334-1-T
Contracts Cwb10795, Cwb10564, Proj. 06334
Unclassified report

Descriptors: (*Meteorology, Cumulus clouds), (*Cumulus clouds, Meteorology), (*Meteorological satellites, Cumulus clouds), Pacific Ocean, Cloud cover, Climatology, Meteorological parameters, Atmosphere, Wind, Velocity, Tables, Meteorological charts, Anticyclones, Statistical analysis, Heat transfer.

Cloud pictures from satellites present vast amounts of qualitative information about the physical processes taking place in the atmosphere. Utilization of the data in meteorological analysis requires a transformation from the cloud patterns to quantitative values which describe the physical processes. The purpose of this study is to devise suitable methods for making the conversion, based on the relationships found to exist between the parameters used to describe the cloud patterns and other meteorological variables. The study is confined to the analysis of the low-level cumuliform cloud patterns which occur over the oceans. Observations were taken over the Northeast Pacific Ocean, and were obtained over a three-week period in August and September by TIROS III in 1961 and TIROS V in 1962. The synoptic parameters which were statistically related to the cloud variables were determined by the technique of multiple-discriminant analysis. Cloud amount was most closely related to the location of the observation with reference to the center of the anticyclone. Frequency distributions showed that the observations of cloud amount have a much greater variation from quadrant to quadrant within one sample period than is shown within one quadrant from one year to the next.

PB-167 561 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Cloud Physics Lab., Univ. of Chicago, Ill.
UREA AS AN ICE NUCLEANT FOR SUPERCOOLED CLOUDS,
by Robert G. Knollenberg. 1 Apr 65, 25p
Technical note no. TN-29
Grant NSF G22419
Unclassified report

Descriptors: (*Urea, Artificial precipitation), (*Artificial precipitation, Snow), (*Clouds, Supercooling), (*Ice, Nucleation), Solubility, Heat of solution.

Urea was observed to have extraordinary ice-nucleating properties in laboratory and natural clouds. Ice nucleation was induced in laboratory clouds at temperatures as warm as +6C. The nucleation mechanism involves the high endothermic heat of solution and high solubility of urea. Three field releases of urea in supercooled stratus resulted in marked visual transformation of the cloud and substantial snow showers were produced. It is concluded that urea is an effective seeding reagent for supercooled clouds. In these experiments urea appeared to be equally effective as dry ice in causing shower formation. (Author)

PB-167 590 Field 4A
CFSTI Prices:HC$3.00 MF$0.75

Research and Advanced Development Div., Avco Corp., Wilmington, Mass.
ANTARCTIC RESEARCH AND DATA ANALYSIS. GRAPHICAL REPRESENTATIONS OF THE AVERAGE F-LAYER CONDITIONS OVER THE ANTARCTIC,
by Rudolf Penndorf. 30 Mar 65, 88p
Scientific rept. nos. SR-21, RAD-TR-65-2
Contract NSF C255
Unclassified report

Descriptors: (*Ionosphere, Polar regions), (*Polar regions, Ionosphere), (*Ionospheric propagation, Radio waves), Diurnal variations, Periodic variations, Meteorological parameters, Atmospheric sounding.

Graphical representations are given for the ionospheric F-layer critical frequencies, foF2, for the period July 1957 to December 1958 (IGY). Some representations are for selected months, some for shorter time periods, while others extend up to 1963. (Author)

05. Behavioral and Social Sciences

AD-299 236 Field 5B
CFSTI Price: HC$2.00

Datatrol Corp., Silver Spring, Md.
SUBSUMPTION SCHEME FOR DICTIONARY OF INDEXING EQUIVALENTS,
by Josephine J. Jaster. Feb 63, 34p
Technical rept. IR-3
Contract NSF C295
Unclassified report

Available copy will not permit fully legible reproduction. See also PB-181 712, PB-181 713, and AD-612 200.

Descriptors: (*Subject indexing, Dictionaries), (*Documentation, Classification), (*Classification, andbooks), (*Vocabulary, Subject indexing), Reports, Scientific research, Information retrieval, Indexes.

A subsumption scheme for the vocabularies of AEC, NASA, and ASTIA is presented. The methodology and

criteria used in its development are detailed. The scheme in the form of fields and groups, is essentially a synthesized one. It will be used as a tool in the preparation of a 'Dictionary of Indexing Equivalents' for the three sets of terms. Various categorizations that contributed to the delineation of the groupings are attached as appendices. (Author)

AD-446 448 Field 5I, 5J
CFSTI Price: HC$4.00

Human Resources Research Office, George Washington Univ., Alexandria, Va.
WORK PROGRAM FISCAL YEAR 1965. RESEARCH AND DEVELOPMENT IN TRAINING, MOTIVATION, AND LEADERSHIP.
30 Jun 64, 124p
Contract DA44 188AR02

Unclassified report

Descriptors: (*Training, Army research), (*Motivation, Army research), (*Leadership, Army research), Research program administration, Maintenance, Language, Learning.

NCH-100 022 Div. 5I

National Science Foundation, Washington, D. C.
AMERICAN SCIENCE MANPOWER 1962.
Jun 64, 158p NSF-64-16

Unclassified report

A report of the National Register of Scientific and Technical Personnel.
Available from Superintendent of Documents, GPO, Washington, D. C. 20402, as NS 1.14/2:962, $1.00.

Descriptors: (*Manpower studies, Scientific personnel), (*Scientific personnel, Statistical data), Wages, Education, Industries, United States Government, Government employees, Language, Distribution, United States, Females, Males, Tables.

This report analyzes in detail the education, employment, scientific specialization, and other characteristics reported by approximately 215,000 U.S. scientists in 1962. The National Register is unique in that these professional and economic characteristics are supplied directly by individual scientists.

PB-167 305 Field 5B
CFSTI Prices: HC$5.00 MF$1.00

Auerbach Corp., Philadelphia, Pa.
LANGUAGE AND INFORMATION STRUCTURE IN INFORMATION SYSTEMS.
Doctoral thesis,
by Jerome D. Sable. 1963, 155p

Unclassified report

Descriptors: (*Information retrieval, Vocabulary), Language, Abstracting, Communication theory.

Conclusions: First, the information system and the information must be organized in a way that permits information to be readily stored and, once stored, accessible to an inquirer. Second, languages for communication between the user and the system must be established. This second problem involves two aspects. An adequate command syntax must be provided for use by the indexer, operator, and inquirer to permit abstracting and indexing, storage and directory maintenance, and queries to be posed, and a vocabulary must be established that permits the required semantic discriminations and relations to be made. The results indicate that it is possible for a small group of users that communicate with each other using a technical vocabulary to communicate with an information storage and retrieval system in a formalized language that preserves an aspect of the semantic structure of their natural vocabulary. It is possible to incorporate facilities in the system that enable its users to engage in a multi-stage dialogue with the system, leading from a partially formulated need for information to the fully developed query to which the system can respond with the appropriate information.

PB-167 308 Field 5B
CFSTI Prices: HC$2.00 MF$0.50

American Inst. of Physics, New York.
AID-TO-INDEXING FORMS.
Progress rept. no. 2,
by Pauline Atherton. Dec 64, 31p
Rept. no. AIP/DRP-64-2

Unclassified report

Descriptors: (*Subject indexing, Periodicals), (*Periodicals, Indexes), Physics, Abstracting.

This is a report of the experience gained in using aid-to-indexing forms received from authors of over 2000 papers which appeared in six physics research journals (Applied Optics, Applied Physics Letters, Journal of Applied Physics, The Journal of Chemical Physics, Journal of Mathematical Physics, The Review of Scientific Instruments, and Journal of the Optical Society of America). Examples of executed forms, some revised since AIP/DRP 63-2, are included. The response from authors has been very good. The information obtained is useful for amplifying titles, evaluating abstracts, indicating type of research reported, and choosing subject index entries. The use of the forms by abstract-journal editors and for the experimental development of better indexes is also reported. (Author)

PB-167 309 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

American Inst. of Physics, New York.
A METHOD FOR PRODUCING JOURNAL INDEXES. (PROGRESS SINCE AIP/DRP 63-3) WITH ILLUSTRATIONS.
Progress rept.,
by Pauline Atherton and Vance Weaver. Sep 64, 13p
AIP/DRP-64-3

Unclassified report

Available copy will not permit fully legible reproduction.
See also PB-162 980.

Descriptors: (*Subject indexing, Periodicals), (*Periodicals, Indexes), Physics, Automatic.

An earlier report, AIP/DRP 63-3 is brought up to date and the progress made since August, 1963 reported. For eleven journals published by the American Institute of Physics and its member societies this semi-automatic method of producing and printing journal indexes is employed. This method uses typewritten tabulating cards, a xerographic card-duplicator, and a sequential card camera. Costs, advantages and sensitive areas are described. Illustrations of the Master Citation Card, "galley-proof", and sample pages of a combined index for APPLIED PHYSICS LETTERS and JOURNAL OF APPLIED PHYSICS are included. (Author)

PB-167 358 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Indiana Univ., Bloomington. Linguistics Research Group.
CLASSES USED IN THE AMBIGUITIES ROUTINES OF THE INDIANA UNIVERSITY LINGUISTICS RESEARCH GROUP, 1961-4,
by J. P. Thorne. 1964, 6p
Unclassified report

Descriptors: (*Language, Scientific research), Analysis.

Contents (Homonymy must be allowed for in the lists):
Classes of clause openers (mainly conjunctions, but including some adverbs and pronouns)
Pronouns
Verbs
Adverbs
Nouns
Adjectives.

PB-167 359 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

McGraw-Hill, Inc., New York.
INFORMATION STORAGE/RETRIEVAL,
by William E. Bushor. 1962, 24p
Unclassified report

Pub. in Electronics p40-62 Jun 29 1962.
Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Information retrieval, Reviews), (*Libraries, Automation), Coding, Analysis, Subject indexing, Computer storage devices, Recording systems, Display systems, Distribution, Computers, Punched cards, Magnetic tape, Optical equipment, Professional personnel.

Contents: The information crisis.
Elements and concepts: Information accumulators, information and data, acquisition, language translation, selection, analysis, indexing, codification, storage modes, storage media, search, presentation, reproduction, dissemination
System considerations: Information retrieval, why automated systems. primary problems, user needs, who are the users. system costs
Equipment for storage and retrieval.document systems: Manual systems, punched card systems, computer systems, magnetic tape searchers, Rapid Selector, Flip, File Search, Rapid Access Look-up, Filmsort, Magnavue, Minicard, Media. Aspect systems: Verac, Walnut, Cris, Cram, Microcite, L-3000 System, special systems
Future needs and prospects: Scientific information centers, personnel, input needs, future mass storage devices, woven screen memory, thermoplastic storage, photochromism.

PB-167 364 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Thomas J. Watson Research Center, Yorktown Heights, N. Y.
THE PREPARATION OF AUTO-ABSTRACTS ON THE IBM 704 DATA PROCESSING SYSTEM,
by T. R. Savage. 17 Nov 58, 13p
Unclassified report

See also PB-166 141.

Descriptors: (*Reports, Abstracting), (*Abstracting, Preparation), Automation, Language, Statistical analysis, Analysis, Automatic.

The first step in auto-abstracting is an attempt to analyze this intuitive property of sentences in such a way that it can be translated into machine procedures. One feature seems to be that items of importance in any single document will, of necessity, be emphasized by the author. This emphasis should be indicated by repeated use of certain words and phrases representing these items of importance. Consequently, the individual words in a document are sorted into descending order of frequency and the highest frequency words retained for further analysis. Since the object is to isolate individual sentences, all of these high frequency words are traced to those sentences wherein they appeared, to weigh effectively the exhibited relationships between them. In addition to the mere occurrence of words, some physical basis upon which to appraise intellectual relations also is necessary. The earliest attempt to quantify these relations gives special weight to terms occurring close to one another in any given sentence.

PB-167 374 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
PARTICIPIAL PHRASES FUNCTIONING AS ELEMENTS OF POSTPOSED QUALIFICATION IN NOMINAL GROUPS IN RUSSIAN,
by Hanna K. Cole. Jan 65, 36p LRC-65-WDR-1
Grant NSF GN308
Unclassified report

Descriptors: (*Language, Analysis), (*Vocabulary, Analysis), USSR.

This paper presents rules for nominal groups including participial phrases. The rules were derived from 215 structures collected from 70 pages of running text in a Russian geological journal. (Author)

PB-167 375 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
RELATIVE CLAUSES IN RUSSIAN,
by Hanna K. Cole. Feb 65, 49p LRC-65-WDR-2
Grant NSF GN308
Unclassified report

Descriptors: (*Language, Analysis), USSR.

This paper deals with distributional and formational features of four types of relative clauses in Russian. The data are collected from 200 pages of running text of articles which were published in Soviet journals on economics, history and philosophy. (Author)

PB-167 376 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

IBM Advanced Systems Development Div., Yortown Heights, N. Y.
SELECTIVE DISSEMINATION OF NEW SCIENTIFIC INFORMATION WITH THE AID OF ELECTRONIC PROCESSING EQUIPMENT,
by H. P. Luhn. 30 Nov 59, 22p
Unclassified report

Prepared for presentation at the Meeting of the American Association for the Advancement of Science

Association for Computing Machinery (126th), Chicago, Ill., 29 Dec 59.

Descriptors: (*Documentation, Distribution), (*Scientific research, Distribution), Vocabulary, Automatic, Computers, Electronic accounting machines, Punched cards, Reports, Scientific personnel.

Improvement of scientific communication is sought through machine assisted dissemination of new information. A service system is described in which a new document is characterized by a vocabulary or pattern of keywords. This pattern is then compared with the vocabularies or profiles characterizing each of the participants of the service. If a given degree of similarity exists between the two, the affected participants are notified by a card carrying an abstract. The recipient signifies whether the information is in fact relevant or not by returning or not returning a stub provided with the card. His affirmative response, which may include his request for a copy of the document, is reflected on his profile by incorporating the pattern of the accepted item. Profiles are kept current by discarding patterns after they have reached a certain age. The feedback includes notification of authors as to the reception of their work. The service also facilitates participants' referral of information to others and generally endeavors to promote interchange of information by personal contact. (Author)

PB-167 377 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.
BIBLIOGRAPHY ON THE MECHANIZATION OF INFORMATION RETRIEVAL,
by Charles P. Bourne. 1 Feb 58, 25p
Unclassified report

Descriptors: (*Information retrieval, Bibliographies), (*Bibliographies, Information retrieval), Automation.

This bibliography was collected as an aid to those people who are interested in the mechanization of information retrieval. Attention is primarily focused on the techniques of mechanization (electrical and mechanical), with some attention paid to the attendant auxiliary problems of coding, input-output, and mechanical translation. The citations are made as brief as possible, and list only the first author. Symposium and conference papers were not listed emplicitly if these collections of papers were later published in book form.

PB-167 378 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.
BIBLIOGRAPHY ON THE MECHANIZATION OF INFORMATION RETRIEVAL: SUPPLEMENT I,
by Charles P. Bourne. 1 Feb 59, 25p
Unclassified report

See also PB-167 377.

Descriptors: (*Information retrieval, Bibliographies), (*Bibliographies, Information retrieval), Automation.

This addendum adds to the coverage of the original bibliography by examining the available technical report literature and technical papers that have been presented at conferences during this period. As in the first bibliography, attention is primarily focused on the technique of mechanization, with some attention given to the related problems of machine translation, coding and classification, and input-output to the system. Little or no attention is given to punched card systems because they are already well covered in the current literature. The citations have been made as brief as possible and in some cases list only the first author. Reports that are available from ASTIA are indicated by the AD- number.

PB-167 439 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

IBM Advanced Systems Development Div., Yorktown Heights, N. Y.
RELATIVE EFFECTIVENESS OF DOCUMENT TITLES AND ABSTRACTS FOR DETERMINING RELEVANCE OF DOCUMENTS,
by A. Resnick. 2 May 61, 5p
Unclassified report

Pub. in Science v134 n3484 p1004-6 Oct 6 1961.
See also AD-167 376.

Descriptors: (*Reports, Abstracting), (*Abstracting, Reports), (*Documentation, Distribution), Scientific personnel, Humans.

Individuals who received documents through a selective dissemination of information system were asked to determine the relevance of documents to their work interests on the basis of titles and of abstracts. The results indicate that there are no significant differences between the usefulness of titles and of abstracts for this purpose. (Author)

PB-167 440 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

IBM Research Center, Yorktown Heights, N. Y.
REVIEW OF INFORMATION RETRIEVAL METHODS,
by H. P. Luhn. 1 Oct 58, 13p Research rept. no. RC-59
Unclassified report

Descriptors: (*Information retrieval, Reviews), Statistical analysis, Subject indexing.

Information retrieval objectives are outlined and the various systems that have been employed in their achievement are categorized. The encoding of source documents to prepare them for retrieval operations is also discussed, with emphasis here placed on statistical methods. (Author)

PB-167 441 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Kansas Univ., Lawrence.
ACTIVE LIBRARY AID TO THE HUMANIST AND SOCIAL SCIENTIST,
by Earl Farley. 1962, 4p
Unclassified report

Pub. in Books and Libraries at the University of Kansas v2 n3 p8-11 Nov 1962.

Descriptors: (*Periodicals, USSR), (*Social sciences, Indexes), (*Indexes, Social sciences), Kansas, Universities, Automatic Libraries.

The University of Kansas, through the Library and in cooperation with the Slavic and Soviet Area Studies Program, proposes to publish in early 1963 an experimental issue of a new permuted title index of Slavic journals devoted to the social sciences and humanities. This first

issue of the 'Kansas Slavic Index' (KSI), limited at the outset to Russian titles held by K. U., is now in preparation and will be given initial distribution to several hundred libraries and to some 1200 members of the American Association for the Advancement of Slavic Studies, as well as others interested in receiving it.

PB-167 444 Field 5B, 5G
CFSTI Prices: HC$3.00 MF$0.75

Center for the Information Sciences, Lehigh Univ., Bethlehem, Pa.
MATHEMATICAL THEORIES OF RELEVANCE WITH RESPECT TO THE PROBLEMS OF INDEXING: AN ALGORITHM FOR DOCUMENT CHARACTERIZATION,
by Donald J. Hillman. 12 Mar 65, 59p
Rept. no. R-2
Grant NSF GN177
Unclassified report

Descriptors: (*Reports, Classification), (*Language, Analysis), (*Subject indexing, Reports), Mathematical analysis.

A distinction is made between document retrieval systems and 'fact retrieval' systems, and it is stipulated that for the former the index terms should be the names of the topics dealt with by the documents in the system collection. Such index terms are called 'document characteristics.' A document is then regarded as a complex assertion, and the problem of discovering its characteristics is defined to be that of isolating the referring expressions in the components of the complex assertion. It is shown that the type of reference discernable in simple sentences is preserved when such sentences are transformationally combined to produce complex sentences. Two methods of sentence reduction are examined for this purpose, viz., the derivation of micro-sentences and a kernelization program. Kernels are inefficient for document characterization purposes. Hence, an algorithm is constructed which operates on kernels to form certain micro-sentences called "assertive components". This algorithm together with a method for weighting the referring expressions of assertive components provide the means for assigning characteristics to any given document. The characteristics accurately denote the topics about which assertions have been made in the document, and the weighting of the characteristics supplies a means for assessing how much of the document's content is taken up with a discussion of those topics.

PB-167 445 Field 5J, 5B
CFSTI Prices: HC$3.00 MF$0.75

American Psychological Association, Inc., Washington, D. C.
THEORETICAL AND METHODOLOGICAL CONSIDERATIONS IN UNDERTAKING INNOVATIONS IN SCIENTIFIC INFORMATION EXCHANGE.
Jan 65, 59p Rept. no. APA-PSIEP-12
Contract NSF GN281
Unclassified report

Continuation of Grant NSF G18494.

Descriptors: (*Psychology, Distribution), (*Scientific research, Distribution), Symposia, Scientific personnel, Documentation, Reports, Periodicals.

The findings of the Project on Scientific Information Exchange in Psychology suggest that when establishing new elements or modifying existing information institutions one should consider both the effect on scientists' patronage of other elements in the system and the effect on scientific product. These effects are not necessarily limited to those elements modified, and there is the further possibility of innovation serving as a catalyst which can drive the process of dissemination in one direction or another to emphasize different channels of communication or different types of output. Part I of the report presents an analysis of the effects of innovation relative to the entire process of dissemination and considers individually a number of specific innovations. For each of these innovations the report develops the underlying rationale for such an effort, presents the possible effects, and discusses the location of the effects among the elements involved in the system of dissemination. Part II describes the method and gives the control data for examining the effects of a single innovation (a Proceedings for the APA Annual Convention) on information exchange behavior surrounding a convention presentation and on the subsequent work of both the authors and the other scientists who have some contact with the author relative to his presentation. This discussion represents an example of some of the preparations necessary for undertaking a trial of an innovation. Secondly, Part II presents a third stage of development in the Project's series of studies of conventions, the only example in the Project's work of a 'third-generation' study, that is, one which has undergone three stages of development.

PB-167 446 Field 5B, 5J
CFSTI Prices: HC$3.00 MF$0.75

American Psychological Association, Inc., Washington, D. C.
THE ROLE OF THE TECHNICAL REPORT IN THE DISSEMINATION OF SCIENTIFIC INFORMATION.
Apr 65, 61p Rept. no. APA-PSIEP-13
Grant NSF GN281 Unclassified report
Continuation of Grant NSF G18494.

Descriptors: (*Scientific research, Distribution), (*Reports, Analysis), (*Psychology, Scientific research), Periodicals.

Part I. This report presents first the results of the initial efforts to collect general information on the production of technical reports containing information relevant to the field of psychology, on the types of work thus reported, and on the dissemination not only of the technical report itself but of other versions of the same material. In the second portion, through a detailed comparison of copies of technical reports with archivally published versions of the same material, some clarification of the nature of the technical report and of the functions of this type of dissemination are afforded. (Author) Part II. Because the technical report is not a clear-cut category with a relatively consistent connotation among scientists, the initial portions of this report will be devoted to a description of the general characteristics of these reports in order to develop a background against which to compare the journal articles based on the same material. The study will next explore the ways in which technical reports resemble of differ from their archivally published counterparts and some of the underlying reasons for the observed similarities and differences. Finally, after a detailed and comprehensive comparison of the two media, some observations related to their respective roles and functions in the current system of scientific information exchange will be presented.

PB-167 447 Field 5B, 6E
CFSTI Prices: HC$1.00 MF$0.50

Yale Univ., New Haven, Conn. Medical Library.
CATALOG SUBJECT SEARCHES IN THE YALE MEDICAL LIBRARY,
by Benedict Brooks and Frederick G. Kilgour.
1964, 6p Unclassified report

Pub. in College and Research Libraries p483-7 Nov 1964.

Descriptors: (*Catalogs, Information retrieval), (*Libraries, Information retrieval), (*Subject indexing, Information retrieval), Medicine.

An investigation of the use of subject cards in the catalog of the Yale medical library took place to aid in designing a catalog computerization project. Data gathered by continuous observation during a week of heavy use indicate that, in general, the peak traffic load at the card catalog occurs between 1400 and 1500 hours. On the basis of short interviews of card catalog users, 501 searches, which broke down almost equally between public--251, and staff--250, yielded sixty-four or 12.8 per cent subject searches in all. If only the public is considered, there were forty-five or 17.9 per cent subject searches. In a significant number of cases the purpose of the subject search is to locate a known item, obtain a quick guide to the shelves through the classification number, or to find a particular form of material (e.g., periodicals). (Author)

PB-167 448 Field 5B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
EXPERIMENTS WITH A NEW CLASSIFICATION ALGORITHM,
by David Senechalle. Dec 64, 32p
Rept. no. LRC-64-WTM-6
Grant NSF GN308

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Classification, Automatic), Set theory, Language, Mathematical analysis.

Experiments leading to the development of a new algorithm for automatic classification are described, and some of the mathematical properties of the problem and the algorithm are investigated. The algorithm locates subsets, termed D-clumps, in an object space consisting of a symmetric connection matrix formed from initial binary object-property incidence data. The D-clumps satisfy criteria of internal cohesion, and of differentiation from their respective complements, that make them useful entities in automatic classification procedures. (Author)

PB-167 449 Field 5B, 5G
CFSTI Prices: HC$1.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
SLAVIC COLLECTION RETRIEVAL SYSTEM MANUAL,
by Marj Wightman, Clay Swinburn, and A. T. ten Broeke. Dec 64, 20p Rept. no. LRC-64-TS-2
Grant NSF GN308

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Libraries, Classification), (*Classification, Libraries), USSR, Texas, Universities, Reports, Instruction manuals, Information retrieval, Subject indexing.

The classification scheme used to index a magnetic tape file of Slavic materials contained in the Main Library of The University of Texas is specified. The indexed bibliography is used as a basis for producing selective listings using a coordinate retrieval program developed at the Linguistics Research Center. Instructions for submitting requests for selective bibliographic listings are given. (Author)

PB-167 455 Field 5C
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
SURVEY OF ENERGY AND OIL DEMAND PROJECTIONS FOR WESTERN EUROPE,
by Harold Lubell. 21 May 59, 53p
Rept. no. RM-2385
AD 219 781

Unclassified report

Rept. on Proj. RAND
Available copy will not permit fully legible reproduction.

Descriptors: (*Western Europe, Economics), (*Economics, Fuel oil), (*Fuel oil, Western Europe), Fuel consumption, Oils, Distribution(Economics), Petroleum industry, Industrial production, Coal, Consumption, Population, Wages, Energy, Tables, Statistical data.

The purpose of the paper is to discuss the past relationship between total energy consumption and gross national product in the countries of Western Europe and to summarize the several sets of base figures and projections for consumption of primary energy prepared by the European Coal and Steel Community (ECSC) in Luxembourg, the Organization for Economic Cooperation (OEEC) in Paris, and the Economic Commission for Europe (ECE) in Geneva, all of which were made by relating growth in energy consumption to projections of GNP. These energy projections are compared with a set prepared on a detailed product-by-product basis by the Standard Oil Company of California (SOCal) in San Francisco, and the oil consumption figures for Western Europe which emerge from the various energy projections are compared with the standard estimates for the non-Soviet world published annually by the Chase Manhattan Bank in New York. (Author)

PB-167 470 Field 5I
CFSTI Prices: HC$2.00 MF$0.50

Yale Univ., New Haven, Conn. Dept. of History of Science and Medicine.
THE PRODUCTIVITY OF SCIENTISTS: A PRELUDE TO MANPOWER STUDIES,
by John P. Britton. 1 Nov 64, 30p
Grant NSF GN299

Unclassified report

Descriptors: (*Manpower studies, Scientific personnel), (*Scientific personnel, Manpower studies), Production, Reports, Periodicals, Indexes, Distribution, Tables, Sampling, Graphics, Statistical functions, Probability, Theory.

Previous studies have yielded distributions of productions among scientists which are shown to be incomplete versions of a general complete production distribution. The correction for completeness is found to affect the high producers most markedly and preserves the large proportion of low producers found in earlier studies. The complete-production distribution function is used to determine the probability of an author producing a given number of papers as well as his expected production of any group of scientists can be estimated from their past production. (Author)

PB-167 474 Field 5K, 5A
CFSTI Prices: HC$4.00 MF$1.00

RAND Corp., Santa Monica, Calif.
PROLEGOMENA TO A THEORY OF ORGANIZATION,
by Oskar Morgenstern. 10 Dec 51, 128p
Rept. no. RM-734
ATI 210 734
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Sociology, Theory), (*Management planning, Theory), Communication theory, Military organizations, Game theory, Learning, Costs, Economics, Control.

Contents:
Organization and the economic problem
Preliminary description of a social organization with central direction
Inner and outer activities: aims of organizations
Arrangement of competences
Signaling, information, and memory
Mistakes, errors, and recovery
Controls within the organization
Degrees of organization
Learning
Input-output and costs of operations
Size of organizations
Expansion and growth.

PB-167 491 Field 5G
CFSTI Prices: HC$3.00 MF$0.75

Linguistics Research Center, Univ. of Texas, Austin.
AUTOMATED LANGUAGE ANALYSIS OR SYNTHESIS.
Quarterly progress rept. for 1 Nov 64-31 Jan 65,
by W. P. Lehmann and E. D. Pendergraft. Jan 65, 71p
LRC-65-NSF-23
Grant NSF GN308
Unclassified report

Descriptors: (*Machine translation, Scientific research), (*Language, Scientific research), Programming(Computers), Classification, Automation, Information retrieval, Automatic, Analysis.

Progress is reported in the development of two generalized computer systems: the first designed to implement automatic translation of languages, the second to support basic research in linguistics. The systems complement each other in that basic programs prepared for each are applicable to, and needed in, the other. The common system design contains three sections: one for control, a second for language data processing, and a third for linguistic information processing. The first two sections are now operational. In the third, the syntactic translation algorithm was completed during the quarter. Its operational status was demonstrated by the production of a German-English translation of six paragraphs. Research in automatic classification, information retrieval and techniques of data acquisition is also reported. (Author)

PB-167 492 Field 5B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
A PROGRAMMING SYSTEM FOR COORDINATE RETRIEVAL AND FILE MAINTENANCE,
by A. T. ten Broeke. Apr 65, 26p LRC-65-TS-3
Grant NSF GN308 Unclassified report

Descriptors: (*Information retrieval, Programming-(Computers)), (*Programming(Computers), Information retrieval), Subject indexing, Computer storage devices, Maintenance, Programming languages.

A general information retrieval programming package written in Fortran IV is described. It provides a capability of retrieving information on the basis of any logical sequential set or sets of descriptors meeting the specifications and constraints of the program. The package also includes file creation and maintenance routines. (Author)

PB-167 512 Field 5A
CFSTI Prices: HC$3.00 MF$0.75

Biological Sciences Communication Project, George Washington Univ., Washington, D. C.
INFORMAL COMMUNICATION AMONG BIOSCIENTISTS,
by Jessie Bernard, Charles W. Shilling, and Joe W. Tyson. Dec 63, 55p BSCP-16-63
Grant NSF G23975 Unclassified report

Descriptors: (*Scientific personnel, Social communication), Scientific research, Biological laboratories, Personnel management, Males, Females, Tables.

The purpose of the present study is, first, to determine if there are differences among individual bioscientists in their practices with regard to informal communication according to age and sex and, second, to analyze laboratories with respect to opportunities for informal communication.

PB-167 513 Field 5B
CFSTI Prices: HC$4.00 MF$1.00

National Biomedical Research Foundation, Silver Spring, Md.
SELECTED BIBLIOGRAPHY OF THE INTERNATIONAL GEOPHYSICAL YEAR: AN EXAMPLE OF TABLEDEX FORMATS,
by Fred S. Zusman, Mendall S. Thompson, James B. Wilson, Louis S. Rotolo, and Thomas D. Gomery.
Jul 62, 116p Rept. no. NBR-62071/18100
Grant NSF G18100 Unclassified report
Available copy will not permit fully legible reproduction.
Joint Proj. with Library of Congress, Washington, D. C.

Descriptors: (*Bibliographies, Scientific research), (*Indexes, Digital computers), (*Information retrieval, Indexes), Subject indexing, Periodicals, Reports, Libraries, Programming(Computers).

Tabledex is a coordinate index that retains the convenience and familiarity of a bound-book form and that can also be automatically organized on a digital computer. The volume has been prepared under a project, supported by a Grant from the National Science Foundation, whose main purpose was to prepare computer programs which would compile a Tabledex Index. In order to demonstrate the appearance and use of a Tabledex Index, the computer programs were applied to a Bibliography of scientific articles prepared for the International Geophysical Year by the Library of Congress. In this volume, the bibliography is presented in two different formats of Tabledex Index, as printed out by the IBM 7090 Computer. The first format utilizes words directly as the means of retrieval, while the second format uses coded numbers in the retrieval process. The purpose for printing this bibliography is to show what a Tabledex looks like and to enable a comparison to be made of these two different formats of Tabledex Index in actual use.

PB-167 518 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
SYMPOSIUM ON THE CURRENT STATUS OF RESEARCH AT THE LINGUISTICS RESEARCH CENTER, THE UNIVERSITY OF TEXAS.
1963, 38p
Unclassified report

Symposium held at Washington, D. C., 14 Jun 63, by National Science Foundation.

Descriptors: (*Language, Scientific research), Symposia, Programming(Computers).

Contents:
Linguistics research, by W. Tosh
Computer programming, by R. W. Jonas
Formation structures, by W. B. Estes.

PB-167 519 Field 5B, 5I
CFSTI Prices: HC$2.00 MF$0.50

Center for the Information Sciences, Lehigh Univ., Bethlehem, Pa.
CURRICULUM FOR THE INFORMATION SCIENCES. SYLLABUS FOR COURSE: 'ANALYSIS OF INFORMATION' (I. S. 421),
by Robert S. Taylor. 15 Feb 65, 35p
Rept. no. R-2
Grant NSF GE2569
Unclassified report

Descriptors: (*Documentation, Education), (*Education, Documentation), Information retrieval, Subject indexing, Classification, Analysis, Indexes, Bibliographies, Universities.

Contents:
Syllabus:
Introduction, continuum of indexing methods, terminology
Development of indexing retrieval aids
Derived indexing
Assigned indexing
Codes and notations
Systems considerations.

PB-167 520 Field 5B
CFSTI Prices: HC$6.00 MF$1.25

West Virginia Univ., Morgantown. Library.
UNION LIST OF SCIENTIFIC, TECHNICAL AND SOCIAL SCIENCES SERIALS IN THE WEST VIRGINIA UNIVERSITY LIBRARIES.
Edition no. 3, rev.,
comp. by Michael M. Reynolds. 1965, 201p
Unclassified report

Descriptors: (*Periodicals, Bibliographies), (*Bibliographies, Periodicals), Scientific research, Social sciences, Indexes, West Virginia, Universities.

This list of serial titles and holdings records the scientific, technical and social science serials at the West Virginia University Libraries. These are areas in which the University has especially strong collections. In addition, all the major bibliographic tools available at the University and all West Virginia serials were included, the latter because it was hoped that in presenting a basic list of these serials, a locational device might be developed which would bring together the numerous incomplete sets of these publications. Omitted from the list were serials whose parts are cataloged as separate works, i.e. The American Chemical Society Monograph Series, less used U. S. government documents, and incomplete volumes of serials. (Author)

PB-167 521 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

American Inst. of Physics, New York.
REVIEW OF AIP/DOCUMENTATION RESEARCH PROJECT STUDIES PREPARED FOR PHYSICS ABSTRACTS STAFF,
by Pauline Atherton and Stella Keenan. Mar 65, 18p Rept. no. AIP/DRP-65-2
Unclassified report

Descriptors: (*Documentation, Physics), (*Physics, Abstracting), Indexes.

Contents:
Evaluation of PHYSICS ABSTRACTS coverage
Systems analysis of PHYSICS ABSTRACTS procedures
Sources, form and arrangement of abstract entries in PHYSICS ABSTRACTS
Index preparation and frequency; style of author and subject entry; production notes
Current awareness journal
Other services of an abstract journal
Form and description of AIP/DRP data (as of 2/65)
DRP Report Bibliography.

PB-167 532 Field 5J, 6S
CFSTI Prices: HC$1.00 MF$0.50

Civil Aeromedical Research Inst., Oklahoma City., Okla.
AUDITORY FATIGUE: INFLUENCE OF MENTAL FACTORS,
by Mary Jayne Capps and William E. Collins.
Jan 65, 6p
AM 65-1; N65 18546
Unclassified report

Descriptors: (*Psychoacoustics, Fatigue(Physiology)), (*Fatigue(Physiology), Psychoacoustics), Auditory perception, Hearing, Thresholds(Physiology).

Conflicting reports regarding the influence of mental tasks on auditory fatigue have recently appeared in the literature. In the present study, 10 male subjects were exposed to a 4000 cps fatigue tone at 40 dB SL for 3 min under conditions of mental arithmetic and reverie. Temporary threshold shifts, as indicated by comparing pre- and post-fatigue thresholds, were consistently greater when subjects worked mental arithmetic during exposure to the fatigue tone than when they engaged in reverie. (Author)

PB-167 533 Field 5J, 6S
CFSTI Prices: HC$1.00 MF$0.50

Civil Aeromedical Research Inst., Oklahoma City, Okla.
EFFECTS OF SEVERAL MENTAL TASKS ON AUDITORY FATIGUE,
by William E. Collins and Mary Jayne Capps. Jan 65, 8p
AM 65-2; N65 18558
Unclassified report

Descriptors: (*Psychoacoustics, Fatigue (Physiology)), (*Fatigue (Physiology), Psychoacoustics), Auditory perception, Hearing, Thresholds(Physiology).

Eight male Ss were exposed for three minutes to a 4000 cps fatigue tone at 40 dB SL. Each S was tested under four task-conditions: mental arithmetic (MA), written long division (LD), threshold determination on a 500 cps tone (TD), and reverie (REV). Temporary threshold shifts (TTS) were computed by comparing pre- and post-fatigue thresholds. MA produced significantly more TTS than any other condition, and LD resulted in greater shifts than REV. Amount of auditory fatigue can vary with the type of mental activity performed by the S. (Author)

PB-167 558 Field 5G, 9B
CFSTI Prices: HC$3.00 MF$0.75

Bunker-Ramo Corp., Canoga Park, Calif.
COMPUTER-AIDED RESEARCH IN MACHINE TRANSLATION, D199. RUSSIAN MT EDIT.
Progress rept. no. 8.
9 Mar 65, 97p
Contract NSF C372

Unclassified report

Descriptors: (*Machine translation, Preparation), Computers, Language, Punched cards, Magnetic tape, Errors, Numbers, USSR.

Contents:
Description of machine translation edit program:
Preparation of Russian text for glossary lookup on an IBM-7094 computer
Pre-edit instructions for Russian text
Instructions for keypunching Russian text with numerals and non-Russian words
Verification of card listing
Description of edit output tape
Description of printer output of errors
Flowcharts of Russian machine translation edit program.

PB-167 559 Field 5G, 9B
CFSTI Prices: HC$5.00 MF$1.00

Bunker-Ramo Corp., Canoga Park, Calif.
COMPUTER-AIDED RESEARCH IN MACHINE TRANSLATION, D199. IMPROVED SYNTACTIC FLOWCHARTS; RESEARCH OUTPUT FORMAT.
Progress rept. no. 9.
31 Mar 65, 168p
Contract NSF C372

Unclassified report

Descriptors: (*Machine translation, Processing), Computers, Language, USSR.

Revision and updating of many of the syntactic flowcharts of Report no. 6, Appendix C. Description of the format of the Bunker-Ramo vertical research output and its syntactic blocking codes and translation instructions.

PB-167 567 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
STRUCTURAL MODELS FOR LINGUISTIC AUTOMATION,
by W. P. Lehmann and E. D. Pendergraft. Jan 63,
32p LRC-62-WAA1
Grants NSF G19277, NSF GN54

Unclassified report

Descriptors: (*Language, Automation), Computers, History.

Contents:
Linguistics and the computer
Theories of linguistic structure
Greco-Roman theory
Paninian theory
Semiotic theory
Formalized theory
Structural models
Descriptive formalization
Formalized meta-languages
Generalization
(Final draft of a contribution to the book 'Vistas in Information Handling,' to be published by Information for Industry, Inc., Washington, D. C.).

PB-167 576 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

University Coll., London (England). Psycholinguistic Research Unit.
AUTOMATIC PAUSE-TIME RECORDING, COUNTING AND TOTALISING EQUIPMENT,
by Frieda Goldman-Eisler and Robert Mendoza.
1961, 6p
Grant PHS MH05201 02

Unclassified report

Descriptors: (*Speech, Analysis), (*Speech representation, Electronic equipment), (*Digital recording systems, Speech), Magnetic recording systems, Audio amplifiers, Pulse analyzers, Counting methods, Circuits, Sound, Design, Time, Behavior, Great Britain.

A decade counter and a digital recorder were modified for use as a speech analyzer to investigate pauses during speaking.

PB-167 638 Field 5I
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
SYSTEMS ANALYSIS AND EDUCATION,
by J. A. Kershaw and R. N. McKean. 30 Oct 59, 71p
Rept. no. RM-2473-FF

Unclassified report

Research supported by the Ford Foundation.

Descriptors: (*Education, Operations research), Systems engineering, Costs, Statistical analysis, Students, Performance(Human), Achievement tests, Learning, Tests, Tables.

The purpose of this exploratory study is to assess the possibilities of making quantitative comparisons of education systems, i.e., formal quantitative comparisons of specific systems with variants of them in which changes and innovations are incorporated. The concern is with elementary and secondary schools only. The educational process, the problems of measurement, and available data are discussed. It is concluded that it will soon be feasible to make comparisons of this sort that can help administrators and others choose improved educational systems.

PB-181 549A Field 5A, 15E
CFSTI Prices: HC$1.00 MF$0.50

Assistant Secretary of Defense (Installations and Logistics), Washington, D. C.
DEPARTMENT OF DEFENSE GUIDE TO THE EVALUATION OF THE PERFORMANCE OF MAJOR DEVELOPMENT CONTRACTORS.

Revised pages 11-12, 27-28, 35-36, 43-44, 45-46.
3 May 65, 11p
Unclassified report

Revision pages for document dated 26 Jul 64, PB-181 549 Rev. The complete, revised document is also available from CFSTI as AD-615 844, HC$3.00, MF$0.75.

Descriptors: (*Department of Defense, Research program administration), Handbooks, Reports, Costs, Standards, Scheduling, Management engineering.

06. Biological and Medical Sciences

AD-436 809 Field 6S, 19D
CFSTI Price: HC$1.00

David Taylor Model Basin, Washington, D. C.
MAN'S RESPONSE TO SHOCK MOTIONS,
by Arthur E. Hirsch. Jan 64, 13p
Rept. no. 1797
Unclassified report

Reprint of a paper presented at the Winter Annual Meeting, Philadelphia, Pa., Nov. 17-22, 1963 of the American Society of Mechanical Engineers.
Available copy will not permit fully legible reproduction.

Descriptors: (*Acceleration tolerance, Humans), (*Stress(Psychology), Impact shock), Shock(Mechanics), Shock waves, Shipborne, Underwater explosions, Casualties, Body, Skeleton, Wounds and injuries, Ship decks, Naval personnel.

The response of an unrestrained man to motions similar to those experienced on the decks of ships subjected to the shock wave from an underwater explosion attack is described. Injurious shock levels are estimated and a method for computing velocities at which man will leave the deck under various conditions, is presented.

Patent 3,179,581 Div. 6R

ELECTROCHEMICAL DOSIMETER.
Patent assigned to AEC,
by Seymour Z. Lewin and Ralf H. Koslow. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Dosimeters, Electrochemistry), (*Electrochemistry, Dosimeters), (*Radiation measurement systems, Electrochemistry), Patents.

The dosimeter is used to detect and measure irradiations. Measurements and detection of irradiation are achieved by using the electrochemical effect which occurs in a liquid chemical solution upon irradiation. This principle is the one involved in the operation of a primary electrolytic cell.

Patent Design 201,010 Field 6C

ANIMAL RESTRAINER.
Patent assigned to Army,
by William S. Koon and Nelson P. Musselman. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Laboratory animals, Safety harness), Dogs, Laboratory equipment, Flexible structures, Patents.

The animal restrainer is designed to restrain and move a dog from one place to another. The animal is suspended in a flexible structure made up of crossed straps. The legs protrude through openings in the straps. The device is suspended from a trolley rod.

PB-167 326 Field 6G, 1C, 13G, 19A
CFSTI Prices: HC$2.00 MF$0.50

Frankford Arsenal, Philadelphia, Pa. Research and Development Directorate.
DEVELOPMENT OF THRUSTER, CARTRIDGE ACTUATED, XM25,
by Charles J. Litz, Jr. Jun 64, 37p
Technical memo no. M64-31-1
AD 442 963; N64 26827
Unclassified report

Descriptors: (*Jettisonable cockpits, Explosive actuators), (*Explosive actuators, Cartridges(Pad)), (*Locking fastener devices, Explosive actuators), (*Cartridges (Pad), Explosive actuators), Design, Drop testing, Impact shock, Ballistics, Interior ballistics, Compressive properties, Aircraft canopies.

A design study was made to improve the initial lock of the M20 thruster to prevent premature release (resulting from shock and impact) and rotation of the threaded end cap with respect to the outer body. Two designs were prepared, fabricated, and evaluated. The final thruster design was designated 'Thruster, Cartridge Actuated, XM25.' Results of performance firings at -65F, 70F, and 200F; six- and nine-foot drop tests; static compression-tension tests; and vibration tests indicate that the XM25 thruster met or exceeded the performance of the M20 thruster. The vibration test fixture was desined to simulate aircraft mounting. It is recommended that the XM25 thruster be standardized and that it replace the M20 thruster. (Author)

PB-167 402 Field 6S, 6G
CFSTI Prices: HC$1.00 MF$0.50

Defense Subsistence and Supply Center, Chicago, Ill.
THIRST AND WATER BALANCE IN SURVIVAL CONDITIONS.
Bibliography.
1948, 22p
AD 099 651
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Survival, Bibliographies), (*Thirst, Survival), Water privation, Survival kits, Tolerances-(Physiology), Starvation, Dehydration, Pathology, Metabolism, Physiology, Electrolytes(Physiology), Body fluids, Digestive system, Diabetes, Biochemistry.

PB-167 442 Field 6E
CFSTI Prices: HC$1.00 MF$0.50

System Development Corp., Santa Monica, Calif.

DATA PROCESSING AND THE MEDICAL SCIENCES,
by Virginia Carabillo. 1960, 13p
Unclassified report

Rept. on Proj. MEDIC.
Pub. in System Development Corporation Monthly Magazine Jul-Aug 1960.

Descriptors: (*Data processing systems, Medicine), (*Medicine, Data processing systems), Medical research, Medical examination, Medical personnel, Diagnosis, Therapy, Public health, Automation, Bionics, Punched cards, Statistical analysis, Costs.

PB-167 523 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Sport Fisheries and Wild Life,
Washington, D. C.
A STUDY AND REVIEW OF THE BLACK FRANCOLIN AND THE GRAY FRANCOLIN.
Special scientific rept.
by Gardiner Bump and Janet W. Bump. Apr 64, 94p
Wildlife-81 Unclassified report

Descriptors: (*Birds, Morphology(Biology)), South Asia, Distribution, Acclimatization, Food, Reproduction(Physiology), Eggs, Diseases, Parasites, Motion, Flight, Behavior, Agriculture.

The report summarizes the taxonomy and distribution of representatives of the genus Francolinus native to southern Asia and their introduction into other regions. Of these the northern black francolin (Francolinus francolinus asiae) and the northern gray francolin (Francolinus pondicerianus interpositus) are singled out for detailed consideration since trial releases of these two sub-species are currently underway in southern and southwestern United States. Topics covered include descriptions, habitat, climatic requirements, food and water, general habits, effect of predation, reproductive capacity, and diseases and parasites. An analysis of competing interests, including man and game, breeding, rearing and trapping are also considered. (Author)

PB-167 524 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Sport Fisheries and Wild Life,
Washington, D. C.
PRELIMINARY KEYS TO WATERFOWL AGE AND SEX IDENTIFICATION BY MEANS OF WING PLUMAGE.
Special scientific rept.,
by Samuel M. Carney. Mar 64, 54p Wildlife-82
Unclassified report

Descriptors: (*Birds, Morphology(Biology)), Sex, Identification, Males, Females, Aging(Physiology), Anatomy, Feathers.

The paper describes characters in the wing plumage that are useful for determining age and sex of most common species of ducks. Each species is discussed briefly, and a key outlining a logical order in which to examine age and sex characters is presented. This report was prepared in response to requests for information and should be considered a preliminary report on work in progress. A more complete report elaborating upon the material presented here and incorporating new findings will be published later. (Author)

PB-167 525 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Sport Fisheries and Wild Life,
Washington, D. C.
A STUDY AND REVIEW OF THE JAPANESE GREEN AND THE KOREAN RING-NECKED PHEASANTS.
Special scientific rept.,
by Wayne H. Bohl. Jun 64, 73p Wildlife-83
Unclassified report

Descriptors: (*Birds, Morphology(Biology)), Japan, North Korea, South Korea, Manchuria, Distribution, Food, Acclimatization, Reproduction(Physiology), Eggs, Diseases, Parasites, Flight, Motion, Behavior, Agriculture.

Following a general review of the taxonomy, distribution and descriptions of the Japanese green pheasants (Phasianus versicolor) and the Korean and Manchurian ring-necked pheasants (P. c. karpowi and P. c. pallasi) detailed consideration is given to their habitat and cover preferences, climatic and food and water requirements, general habits and reproductive capacity. Their relation to agriculture, to other game birds within their native range, an evaluation of their potentialities for trial introduction into the United States and suggestions for game farm propagation are also discussed. (Author)

PB-167 526 Field 6C
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Sport Fisheries and Wild Life, Washington, D. C.
A STUDY AND REVIEW OF THE COMMON INDIAN SANDGROUSE AND THE IMPERIAL SANDGROUSE.
Special scientific rept.,
by Glen C. Christensen, Wayne H. Bohl, and Gardiner Bump. Jun 64, 81p Wildlife-84
Unclassified report

Rept. on Common Indian Sandgrouse prepared in cooperation with Nevada Fish and Game Commission.

Descriptors: (*Birds, Morphology(Biology)), Europe, Asia, Africa, India, Distribution, Ecology, Food, Reproduction(Physiology), Eggs, Diseases, Parasites, Acclimatization, Motion, Flight, Agriculture, Behavior.

The report summarizes the taxonomy and distribution of the sandgrouse family (Pteroclididae) in Europe, Asia, and Africa. Two representatives, the common Indian sandgrouse (Pterocles exustus hindustan) and the imperial or black-bellied sandgrouse (Pterocles orientalis) are singled out for detailed consideration because trial releases of these into the western United States have been made or are contemplated. Topics covered include descriptions, habitats, climatic requirements, food and water, general habits, effect of predation, reproductive capacity, and diseases and parasites. Also considered are their relation to agriculture and to other game species together with notes on the breeding, rearing, and trapping of these sandgrouse. (Author)

PB-167 527 Field 6C
CFSTI Prices: HC$4.00 MF$1.00

Bureau of Sport Fisheries and Wild Life, Washington, D. C.
WATERFOWL STATUS REPORT 1964.
Special scientific rept.,
comp. by Henry A. Hansen. Oct 64, 146p
Wildlife-86 Unclassified report

Descriptors: (*Birds, North America), Ecology, Reproduction(Physiology), Aging(Physiology), Tables.

Contents:
Winter survey
Breeding ground surveys
Banding and recovery data
Harvest data.

PB-167 528 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Bureau of Sport Fisheries and Wild Life, Washington, D. C.
WOODCOCK STATUS REPORT, 1964.
Special scientific rept.
comp. by Fant W. Martin. Oct 64, 49p
Wildlife-88
Unclassified report

Descriptors: (*Birds, North America), Ecology, Reproduction(Physiology), Population, Aging(Physiology), Sex, Females, Males, Tables.

An index of size of the woodcock breeding population in 1964 was obtained from singing-ground counts conducted in 20 eastern and central States and 4 eastern Canadian Provinces. East of the Appalachians, 153 routes run in both 1963 and 1964 were available for comparison. West of the mountains, 133 comparable routes were covered. The population index rose 7 percent in the East and 13 percent in the West. For both regions combined, the index increased 11 percent. It is doubtful if this represents a significant change in size of the breeding population from 1963 to 1964. An index of woodcock productivity in 1962 and 1963 was obtained from age ratios in the hunting kill as determined from 28,141 wings contributed by hunters. The number of immatures per adult female in the continent-wide kill, weighted by kill estimates, was 1.8 in 1962 and 1963. Similarly, the number of immatures per adult (both sexes combined) was 1.1 in both years. These identical age ratios suggest that productivity did not change from 1962 to 1963. (Author)

PB-167 529 Field 6C
CFSTI Prices: HC$5.00 MF$1.00

Bureau of Sport Fisheries and Wild Life, Washington, D. C.
DISTRIBUTION OF RECOVERIES FROM BANDINGS OF DUCKLINGS.
Special scientific rept.,
by Calvin J. Lensink. Dec 64, 157p Wildlife-89
Unclassified report

Descriptors: (*Birds, Identification), Distribution, Recovery, North America, Geography, Maps.

The report presents the recovery distributions of 10 species of game ducks banded as flightless young on the breeding grounds. Conclusions are based on 20,152 direct or first year band recoveries, 9,272 of which are of mallards. The recovery distributions of these ducks by State and Flyway, or country, of recovery from breeding ground aerial survey strata or State of banding are presented. In addition, mallard recoveries from bandings grouped by geographical region are presented to show distribution variations attributable to region, year of banding, sex, first year versus later years of recovery, weather, etc. Recovery rates of mallards banded as flightless young and the affects of various factors on recovery rates are discussed. (Author)

07. Chemistry

AD-291 420 Field 7A, 7D
CFSTI Price: HC$1.00

Washington Univ., Seattle. Coll. of Engineering.
TRANSPORT PROPERTIES OF LIQUIDS AND GASES AT HIGH TEMPERATURES.
Final rept. for 1 Jul 59-30 Jun 62,
by Albert L. Babb. 31 Oct 62, 9p
Contract DA04 200ORD999; Grant DA ARO D31 124G107
AROD 2380:5
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Gases, Transport properties), (*Liquids, Transport properties), (*Transport properties, Temperature), Diffusion, Ethers, Chloroform, Methyl radicals, Ethyl radicals, Ketones, Carbon tetrachloride, Ethanols, Methanes, Acetones, Nitro radicals, Diffusion theory, Benzenes.

AD-420 477 Field 7D, 7C
CFSTI Price: HC$2.00

Royal Inst. of Tech., Stockholm (Sweden).
NUCLEAR MAGNETIC RESONANCE WIDE LINE STUDIES OF INTERMOLECULAR HYDROGEN BONDING IN HIGH POLYMERS: I. CELLULOSE.
Annual technical rept. for 1 Feb-30 Apr 63,
by Erik Forslind. 30 Apr 63, 36p
Contract DA91 591EUC2364
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Cellulose, Chemical bonds), (*Nuclear magnetic resonance, Cellulose), (*Chemical bonds, Cellulose), Hydrogen, Water, Hydroxides, Crystal lattices, Polymers, Adsorption.

The purpose of this investigation is to provide experimental NMR data in an attempt to throw some light on the water fixation problem in native cellulose and mercerized cellulose. Equipment for the conditioning of cellulose specimens was developed. Spectra were taken for samples equilibrated at various relative humidities as they became available, and some of the data so accumulated were used to make a first rough estimate of the zeroth order bond moments based on a rather arbitrary but reasonable separation of the narrow and broad bands of the NMR spectra. The tentative conclusion derived from this preliminary calculation is that water in primary and secondary adsorption sites satisfy the equilibrium conditions required by the Law of Mass Action implying that the water molecules in primary adsorption sites are easily accessible to the remainder of the adsorbed water. The electronic computational work has been progressing and some preliminary results are indicated in this report.

PB-167 477 Field 7E, 20L
CFSTI Prices: HC$3.00 MF$0.75

Ohio State Univ. Research Foundation, Columbus.
STUDY OF SEMICONDUCTOR SOLIDS USED AS PHOTOCATALYSTS IN THE FORMATION OF ENDOTHERMIC COMPOUNDS.
Final rept.,
by Jack G. Calvert. Sep 63, 81p
Contract AF19 604 6644, Proj. 6694, Task 669401
AFCRL 64-120; AD 434 789
Unclassified report

Descriptors: (*Semiconductors, Photochemistry), (*Photochemistry, Catalysts), Photosensitivity, Cadmium compounds, Sulfides, Adsorption, Water,

Oxygen, Hydrogen peroxide, Spectra(Infrared), Specra (Visible + ultraviolet), Ultraviolet radiation, Paramagnetic resonance, Electrons, Spin, Resonance, Hall effect, Single crystals, Crystal lattices, Impurities, Copper, Chromium, Nickel, Indium, X-ray diffraction analysis, Polarization, Precision finishing.

In the study several large single crystals of pure and doped C and S were employed. The physical properties of the crystals through the use of X-ray, infrared, and visible spectroscopy, electron spin resonance, electrical mobility, and Hall constant measurements were determined. The same crystals were used in powdered form to determine the quantum efficiency of reactions photosensitized by them. The results of these diversified studies are compared and evaluated, and the mechanisms of the peroxide-forming reaction and C and S oxidation reaction in the CdS-H20-02 mixtures are elucidated.

PB-167 479 Field 7D, 7C, 11I
CFSTI Prices: HC$1.00 MF$0.50

Wisconsin Univ., Madison.
DYNAMIC MECHANICAL PROPERTIES OF POLYMERS AND THEIR SOLUTIONS AND GELS.
Final rept.,
by John D. Ferry. 12 Nov 63, 8p
Contract DA11 022ORD3336; Grant DA ARO D31 124G110, Projs. 599 01 004, 2589C
AROD 2589:8; AD 425 156

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Polymers, Viscoelasticity), (*Viscoelasticity, Polymers), Polyester plastics, Polyethylene plastics, Solutions, Gels, Mechanical properties, Molecular properties, Friction, Viscosity, Relaxation time, Shear stresses, Transition temperature.

The research was undertaken to study the viscoelastic properties (in small deformations) of various carefully chosen polymer systems over wide ranges of temperature, time, and frequency; and to relate the mechanical behavior to chemical structure and molecular motions, focussing attention on certain important parameters including the free volume, the monomeric friction coefficient, and the spacing between entanglement coupling loci. The results are briefly summarized and the eight publications generated under the contract are listed.

PB-167 577 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Eugene H. Drake Memorial Lab., Portland, Maine.
AMPHOLYTIC PERMSELECTIVE MEMBRANES,
by Jerome R. Tichy. 1957, 15p
Grant NIH H5380

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Ion exchange resins, Membranes), (*Membranes, Ion exchange resins), pH, Ions, Ion exchange, Buffers, Amino acids, Hydrochloric acid, Colloids.

The preparation of an ampholytic permselective membrane containing histidine HCl1 embedded in a collodion matrix is described. From Nernst potential measurements in the pH range of 2.00-10.00, the membrane iso-electric point was found to be 6.60. When the membrane iso-electric point is corrected for the fixed negative charges present in the collodion, the histidine iso-electric point is found to be 7.32 ± 0.10. This value is in agreement with the known histidine iso-electric point of 7.59. The membrane is not stable and on prolonged standing in a buffer of 9.50 the membrane iso-electric point shifts to 3.40. (Author)

08. Earth Sciences and Oceanography

Patent 3,178,736 Div. 8J

DEEP SUBMERGENCE TYPE BUOYS.
Patent assigned to Navy,
by Seymour Gross. 20 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Buoys, Underwater), Design, Patents.

The buoy is for supporting oceanographic and scientific instruments and apparatus at great depths in the ocean for long periods of time. Sonar devices may be supported by the buoy. The housing carries the instruments in its lower part. The upper part of the housing is a shell with openings. The shell chamber is open to the sea. A plurality of spherical float elements of polypropylene are carried in the upper chamber.

PB-167 259 Field 8A, 7B, 7C
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Commercial Fisheries, Galveston, Tex.
PRELIMINARY RESULTS OF THE SYSTEMATIC SCREENING OF 4,306 COMPOUNDS AS 'RED-TIDE' TOXICANTS,
by Kenneth T. Marvin and Raphael R. Proctor, Jr.
Mar 64, 85p
FWS DR2

Unclassified report

Descriptors: (*Marine biology, Plankton), (*Plankton, Control), Toxicity, Chemical compounds, Microorganisms, Tests, Sea water, Seacoast, Florida.

The report presents the results of preliminary screening tests which evaluated 4,306 chemical materials as control agents for the red-tide organism, Gymnodinium breve. (Author)

PB-167 260 Field 8J, 8C
CFSTI Prices: HC$2.00 MF$0.50

Bureau of Commercial Fisheries, Seattle, Wash. Biological Lab.
NORTH PACIFIC OCEANOGRAPHY, FEBRUARY-MARCH 1963,
by W. James Ingraham, Jr. Apr 64, 28p
FWS DR3

Unclassified report

Descriptors: (*Pacific Ocean, Oceanographic data), (*Oceanographic data, Pacific Ocean), Aleutian Islands, Temperature, Salinity, Density, Bathythermograph data, Fishes.

Oceanographic data obtained at and between salmon fishing stations on the February 9 to March 12, 1963, cruise of the MV George B. Kelez are presented. The

closely spaced observations (48.3 km.) along long. 165 degrees W. south of the Aleutian Islands to lat. 44 degrees 30 minutes N. are the most complete winter data available in that area. Vertical sections of temperature, salinity, and density to 1,000 meters were made from lat. 53 degrees 45 minutes N. to 44 degrees 30 minutes N. along long. 165 degrees W. Surface temperature and salinity data were taken at intervals of approximately 32.3 km. from lat. 53 degrees 27 minutes N., long. 145 degrees 51 minutes W. to the entrance of Strait of Juan de Fuca. Comparison of 1962 and 1963 winter data south of the Aleutian Islands indicated that major features of the temperature, salinity, and density distribution did not exhibit significant variation except for the temperature-minimum stratum at lat. 49 degrees N. to 50 degrees N., long. 165 degrees W. In 1963 the temperature-minimum stratum appeared to be only half as wide as in 1962 and 1 degree of latitude farther north. (Author)

PB-167 261 Field 8H, 8A
CFSTI Prices: HC$4.00 MF$0.75

Bureau of Commercial Fisheries, St. Petersburg Beach, Fla. Biological Station.
HYDROGRAPHIC OBSERVATIONS OF TAMPA BAY, FLORIDA, AND ADJACENT WATERS, AUGUST 1961 THROUGH DECEMBER 1962,
by Carl H. Saloman, John H. Finucane, and John A. Kelly, Jr. Jun 64, 114p
FWS DR4

Unclassified report

Descriptors: (*Hydrographic surveying, Florida), (*Mexico Gulf, Hydrographic surveying), (*Bays, Hydrographic surveying), Collecting methods, Tides, Temperature, Salinity, Phosphates, Phosphorus, Nitrogen, Oxygen, Ph, Light transmission, Colors, Clouds, Visibility, Wind, Chlorophylls, Ecology, Marine biology.

Hydrographic data are presented for Tampa Bay and offshore Gulf of Mexico waters for the period August 1961 through December 1962. Methods of collecting and analyzing samples are described. Observations include tide stage, water temperature, salinity, total phosphate phosphorus, inorganic, organic and total nitrogen, oxygen, pH, light transmission, water color, cloud amount, cloud type, visibility, wind amount, wind direction, sea amount, sea direction, and chlorophyll. Observations were made as part of an esturine ecological program in Tampa Bay, Fla. (Author)

PB-167 499 Field 8E, 20F
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
INDEX OF REFRACTION, STATUS REPORT,
by S. E. Smathers. Aug 63, 17p

Unclassified report

Descriptors: (*Geodesics, Instrumentation), (*Refractive index, Corrections), Refractometers, Anemometers, Distance - measuring equipment.

The Coast and Geodetic Survey has initiated a Research and Development program to re-evaluate the current technique for making the refractive index correction to electromagnetic distance-measuring instruments. The Bureau has firm plans for the near future to establish first-order base lines in the United States in both the north-south and east-west directions. The accuracy expected is a part per million. Since these lines will be measured with the geodimeter, the primary objective of the Coast and Geodetic Survey program is to improve the index of refraction correction for optical frequencies. A precise base line is being established in the Washington area to obtain definitive data on the fluctuations of the atmospheric index of refraction and to provide a taped line for calibration and comparative studies of distance measuring instruments. The feasibility of using sound, under special conditions to measure mean temperature along a geodetic line is being investigated and shows some promise. If this technique is successful, it may be possible to limit the error in distance measurements, due to temperature, to one part per million. The development of a short-path infrared hygrometer by the Boeing Company and subsequent research studies indicates the technical feasibility of developing a long-path infrared optical refractometer. Such a system must be demonstrated and stand the rigor of complete laboratory and field tests and evaluation. (Author)

PB-167 502 Field 8H, 17G
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
ELECTRONIC CONTROL SYSTEMS USED ON HYDROGRAPHIC SURVEYS,
by Gilbert R. Fish. 1964, 16p

Unclassified report

Descriptors: (*Hydrographic surveying, Electronic equipment), (*Shoran, Hydrographic surveying), (*Position finding, Hydrographic surveying), Control systems, Phase measurement, Sound ranging.

At the present time the Coast and Geodetic Survey is using three different electronic systems to furnish control for hydrographic surveys. Two of them, Shoran and the Electronic Position Indicator, are pulsing systems and the third, Raydist, is a phase measuring system. Shoran is the most widely used system. The Coast and Geodetic Survey began using this system shortly after the end of World War II and it is now used to control most of the surveys that are not too far distant from the shoreline. For surveys beyond the range of Shoran and where a high degree of position accuracy is not required the EPI is used. For surveys a considerable distance offshore and where good position accuracy is desired the Raydist has been found very suitable. The three systems, Shoran, EPI and Raydist, complement each other and each has characteristics that make it useful for certain conditions. (Author)

PB-167 503 Field 8E, 8F, 3A
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
HITCHING OUR COUNTRY TO THE STARS,
by Leo Otis Colbert. 1946, 21p

Unclassified report

Paper presented before the National Capital Astronomers, Washington, D. C., 7 Dec 46.

Descriptors: (*Surveying, Astronomical data), Geodesics, Astronomy, Celestial navigation, Geography, Earth, Mapping, Ocean bottom, Hydrographic surveying, Echo ranging, Tides, Terrain, Geological survey.

A discussion is presented on the importance of astronomy is survey operations. Astronomical observations provide an accurate means for geodetic and hydrographic surveying, and for navigation and mapping.

PB-167 505 Field 8K, 17J
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
REPORT ON INVESTIGATION OF SOURCE OF EARTH DISTURBANCES FELT IN CENTRAL CITY BUILDINGS, WILKES-BARRE, LUZERNE COUNTY, PENNSYLVANIA, DECEMBER 28-31, 1959,
by L. M. Murphy and F. H. Werner. 11 Jan 60, 10p
Unclassified report

Descriptors: (*Seismology, Pennsylvania), Seismographs, Urban areas, Buildings, Blast, Tables, Mining engineering.

PB-167 506 Field 8E
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
HORIZONTAL CRUSTAL MOVEMENTS IN CALIFORNIA,
by E. B. Brown and Charles A. Whitten. 1961, 16p
Unclassified report

Rept. presented at the Western National Meeting of the Geodesy Section of the American Geophysical Union (1st), Los Angeles, Calif., 28 Dec 61.

Descriptors: (*Geodesics, California), (*Earthquakes, California), Geological survey, Surfaces, Earth, Measurement.

PB-167 507 Field 8C, 8H, 8J
CFSTI Prices: HC$2.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
ENGINEERING MANAGEMENT IN OCEANOGRAPHY,
by H. Arnold Karo. 1963, 26p
Unclassified report

Rept. presented at the Symposium on Engineering Management at the Annual Meeting of the Society of American Military Engineers (43d), Washington, D. C., 20 May 63.

Descriptors: (*Oceanology, Management engineering), United States Government, Oceanographic data, Scientific research, Scientific personnel, Management planning, Instrumentation, Data processing systems, Hydrographic surveying.

Summary and conclusions: Engineering management in oceanography attempts to (1) define the problem; (2) set the national goals in oceanography; (3) break down the long-range goals into short-range goals and agency missions, integrating all requirements for various type data, investigation, etc., possible of attainment within the various agency missions, though not a specific requirement of the agency itself; (4) determine accuracy requirements--minimal requirements versus maximum attainable requirements versus cost; (5) allocate optimum resources--ships, men, facilities, and research and development programs to capitalize on technological developments and possible breakthrough; (6) develop optimum operational plans and procedures; (7) dictate just when, where, and how resulting data will be reduced, the degree of reduction and the form, the accuracy and the method of presentation; and (8) publish the final results--whether in tabular form, graph or atlas, and determine the method of distribution to consumers. (Author)

PB-167 522 Field 8A
CFSTI Prices: HC$2.00 MF$0.50

Bureau of Sport Fisheries and Wild Life, Washington, D. C.
COMPREHENSIVE BIBLIOGRAPHY OF ZOSTERA MARINA.
Special scientific rept.,
by Ronald C. Phillips. Jan 64, 38p Wildlife-79
Unclassified report

Prepared by Department of Botany, Seattle Pacific Coll., Wash.

Descriptors: (*Marine biology, Bibliographies), (*Plants(Botany), Marine biology), Ecology, Diseases.

PB-167 530 Field 8B
CFSTI Prices: HC$5.00 MF$1.25

Coast and Geodetic Survey, Washington, D. C.
OBLIQUE MERCATOR PROJECTION TABLES.
Jun 51, 194p
Unclassified report

Descriptors: (*Map projection, Tables), Mapping.

The purpose of this series of nineteen bands of oblique Mercator projection tables is to provide coverage for route charting in which the scale errors are held to a minimum. The X and Y coordinates for each band are listed in meters for degree-intersections of parallels and meridians. The bands have an effective width of 16 degrees of a great circle (about 1100 statute miles).

PB-167 535 Field 8B, 17G
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
Nautical Chart Div.
THE REPRESENTATION OF COASTLINES ON NAUTICAL CHARTS,
by G. H. Everett and Lewis W. Evans, III.
1961, 6p
Unclassified report

United States Delegation to the United Nations Regional Cartographic Conference for Asia and the Far East (3rd) held at Bangkok, Thailand 27 October-10 November 1961.

Descriptors: (*Navigation charts, Preparation), Hydrographic surveying, Geodesics, Mapping.

PB-167 536 Field 8E, 8B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
Triangulation Branch.
ELECTRONIC COMPUTATION IN SURVEYING AND MAPPING,
by Charles A. Whitten. 1961, 10p
Unclassified report

United States Delegation to the United Nations Regional Cartographic Conference for Asia and the Far East (3rd) held at Bangkok, Thailand 27 October-10 November, 1961.

Descriptors: (*Surveying, Digital computers), (*Mapping, Digital computers), Geodesics, Programming(Computers).

PB-167 537 Field 8G
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
IS SEA LEVEL FALLING OR THE LAND RISING IN SOUTH EAST ALASKA,
by Charles Pierce and William Shofnos. 1961, 9p
Unclassified report

United States Delegation to the United Nations Regional Cartographic Conference for Asia and the Far East (3rd), Bangkok, Thailand, 27 Oct-10 Nov 61, in support of Agenda Item 12, Geodesy, (k) Tides.

Descriptors: (*Geological survey, Alaska), (*Alaska, Geological survey), Terrain, Glaciers, Bays, Tides, Mapping, Symposia.

PB-167 540 Field 8B, 14E
CFSTI Prices: HC$1.00 MF$0.50

Aeronautical Chart and Information Center, St. Louis, Mo.
RECENT DEVELOPMENTS IN CARTOGRAPHIC METHODS AND TECHNIQUES.
1961, 8p
Unclassified report

Rept. prepared in cooperation with the Coast and Geodetic Survey, Washington, D. C., and presented at the United Nations Regional Cartographic Conference for Asia and the Far East (3rd), Bangkok, Thailand, 27 Oct-10Nov 61, in support of Agenda Item 18, Aeronautical Charts, (a) Recent Developments in Aeronautical Charting Methods and Techniques.

Descriptors: (*Mapping, Photographic techniques), Aerial photography, Color photography, Sequential photography, Photographic printers, Contact printers, Maps, Printing, Quality control, Copying cameras.

Contents:
Electronic dodging printer
Elastic image-modification in compilation
Portable photographic contact printer
Quality controls in printing
Working copy in color
Advances in the photomechanical preparation of physical relief portrayal
Photopolymerization method for creating physical relief models
The rotoverser
Sequential camera technique for frequently revised publications
Preparation of scribeguides by the rub-on diazo method
Improved negative and scribing opaque.

PB-167 541 Field 8E, 14B
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
USE OF THE GEODIMETER AND TELLUROMETER IN GEODETIC MEASUREMENTS, Unclassified report
by H. Arnold Karo. 1958, 12p
Paper presented at the United Nations Regional Cartographic Conference for Asia and the Far East (2nd), Tokyo, Japan, 20 Oct-1 Nov 58, in support of Agenda Item 8, Geodesy, (g) Rept. on the Use of the Geodimeter and Tellurometer in Geodetic Measurements.
Available copy will not permit fully legible reproduction.

Descriptors: (*Geodesics, Instrumentation), Terrain, Measurement, Meteorological parameters, Vibration, Microwaves, Propagation, Cathode ray tubes, Mapping, Symposia.

Since the microwave propagation characteristics in the Tellurometer system are more sensitive to topographical and meteorological conditions than in the Geodimeter system, repeatability of the Tellurometer approaches but cannot equal that of the Geodimeter. The smallest division on the cathode ray tube of the Tellurometer corresponds to 0.15 meter or about 6 inches. The instrument was not designed to be all purpose but to give high accuracy over ranges from 10 to 30 miles. The Geodimeter and the Tellurometer are very useful additions to the geodetic instruments of the Coast and Geodetic Survey. The Geodimeter is being used continuously for measurement of first-order triangulation base lines and Tellurometers are being employed constantly in traverse line measurements. The maintenance requirements of these equipments is considered no more than that to be expected from electrical equipment. Certain modifications to the Tellurometer, while not imperative, would enhance its flexibility and operation. (Author)

PB-167 563 Field 8K
CFSTI Prices: HC$2.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
Triangulation Branch.
HORIZONTAL CRUSTAL MOVEMENTS IN THE UNITED STATES, Unclassified report
by Buford K. Meade. 1963, 26p
International Union of Geodesy and Geophysics. International Association of Geodesy, Report to the Commission on Recent Crustal Movements.

Descriptors: (*Earthquakes, United States), Faults(Geology), Geophysics, Geological survey, Seismology.

The United States Coast and Geodetic Survey has conducted a program for the study of earth movement at different intervals of time since the 1906 earthquake in California. The outline map of the western part of the United States attached to this report shows areas where major surveys have been made for the study of horizontal earth movement.

PB-167 564 Field 8J, 8N
CFSTI Prices: HC$5.00 MF$1.00

Naval Oceanographic Office, Washington, D. C.
OPERATION DEEP FREEZE 62, 1961-1962 MARINE GEOPHYSICAL INVESTIGATIONS.
Feb 65, 166p Technical rept. no. TR-118
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Marine geophysics, Polar regions), Oceanology, Terrestrial magnetism, Bathythermograph data, Ocean bottom sampling, Ice, Icebreakers.

The report contains results of the Marine Geophysical Investigations in the Antarctic and along USS BURTON ISLAND track to and from Antarctica. Data on the thermal structure, salinity, density, dissolved oxygen, field description of bottom sediments, ice distribution, bathymetry, and geomagnetic measurements are presented. Appendix A contains a tabulation of oceanographic data for 60 stations and Appendix B, the field description of 64 bottom sediment samples. (Author)

PB-167 568 Field 8E
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.

USE OF STATE PLANE COORDINATES IN ROUTE SURVEYING,
by Hugh C. Mitchell. Jun 50, 12p
Unclassified report

Descriptors: (*Surveying, Theory), Geodesics.

PB-167 570 Field 8B, 8E, 8G, 8J, 8K, 8N
CFSTI Prices: HC$3.00 MF$0.75

Coast and Geodetic Survey, Washington, D. C.
PROJECTED COAST AND GEODETIC SURVEY RESEARCH AND DEVELOPMENT ACTIVITIES, FISCAL YEARS 1964-1965.
Jan 64, 85p
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Scientific research, Geophysics), (*Geophysics, Scientific research), Research program administration, Oceanology, Terrestrial magnetism, Seismology, Geodesics, Photogrammetry, Mapping, Operations research.

This paper considers the total programs proposed for research and development within the Coast and Geodetic Survey in fiscal years 1964 and 1965. It is prepared as a guideline of activities for this function of the Bureau. It gives the background which led to the initiation of the Office of Research and Development in late 1960, the measures taken to establish an adequate overall program, the broad objectives and goals for fiscal years 1964 and 1965, and, in greater detail, the description of individual research and development programs for fiscal years 1964 and 1965.

09. Electronics and Electrical Engineering

AD-279 556 Field 9B, 5C
CFSTI Prices: HC$2.00

RAND Corp., Santa Monica, Calif.
DATA DESCRIPTION FOR DETAB-X (DECISION TABLE, EXPERIMENTAL),
by Solomon L. Pollack and Kendall R. Wright.
Mar 62, 49p Rept no. RM-3010-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.
Available copy will not permit fully legible reproduction.
See also AD-282 602, AD-294 318, AD-295 952, and AD-610 834.

Descriptors: (*Programming(Computers), Commerce), (*Commerce, Programming languages), (*Programming languages, Computers), Data processing systems, Decision theory.

DETAB-X is a language based on COBOL 61 and structured with decision tables, the technique for which is regarded by the systems group of the CODASYL development committee as a powerful tool for stating business problems. This paper concerns itself with specifications for data description of DETAB-X and must be considered as supplementary to the official COBOL manual. (Presented at a meeting of the CODASYL systems group held in Philadelphia, Jan. 23-26, 1962)

AD-289 205 Field 9A, 20L
CFSTI Price: HC$3.00

David Sarnoff Research Center, Princeton, N. J.
RESEARCH ON METALLIC CONTACTS TO SEMICONDUCTORS.
Final rept. for 23 Jun 60-22 Jun 62,
by A. M. Goodman and W. W. Mehl. 22 Jul 62, 97p
Contract DA36 034ORD3283RD, Projs. 599 010 07, TB2 0002
AROD 2838:1
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Semiconductors, Electric connectors), (*Electric terminals, Semiconductors), Capacitance bridges, Solid state physics, Numerical analysis, Probability, Surface area, Thin films, Electric currents, Measurement, Voltage, Work functions, Photoelectric effect, Cadmium compounds, Sulfides, Crystals, Crystal structure, Gold plating, Nickel plating, Copper, Plating, Germanium, Chemical melting.

Rectifying contacts were prepared by plating metal onto crystallographically oriented, conducting, single crystal, cadmium sulfide blocks. The net work function of the metal with respect to the semiconductor at the contact, was determined by analysis of differential capacitance, current-voltage and photoelectric measurements. All measurements were made at room temperature. Copper, gold, and nickel contacts to n-type germanium were prepared by a procedure which combines electroplating and cleavage. Electronmicrographs of the cleavage plane show that the part of the crystal which was under tension before cleavage gives an almost perfectly flat surface. The network function values were determined by analysis of current-voltage and differential capacitance measurements at room temperature. A unit was developed for cleaving germanium and silicon samples in ultra high vacuum.

AD-401 824 Field 9A
CFSTI Prices: HC$3.00

Shockley Transistor Div., Clevite Transistor,
Palo Alto, Calif.
VHF SILICON POWER TRANSISTOR.
Quarterly rept. no. 2, 1 Oct 62-1 Jan 63,
by R. M. Scarlett. 1 Jan 63, 63p
Contract DA36 039SC90837, Proj. 3A99 21 001
Unclassified report

Descriptors: (*Transistors, Very high frequency), Silicon, Power, Diffusion, Packaged circuits, Stability, Thermal stresses, Temperature, Configuration, Oxidation, Baron, Processing, Oscillators, Surface properties, Aluminum, Metal coatings, Evaporation, Epitaxial growth, Thermal expansion, Copper, Electrical properties, Molybdenum.

Efforts continued on the development of a 50 watt VHF silicon power transistor. The areas of diffusion, metallizing and packaging are described. The theory of lateral thermal instability is discussed. This instability is fundamental to all transistors, and leads to the development of hot spots and consequent secondary breakdown. It severely limits the power capability of large-area devices. Means are proposed to substantially raise the power level at which the instability occurs. Initial experiments in making stabilized devices employing either epitaxially grown resistive emitter layers, or lumped emitter resistors are reported. Experimental devices show the expected small-signal properties but the large-signal performance is still poor due to insufficiently thick metal contacts and the influence of the wide backbone region.

AD-402 852 Field 9A
CFSTI Prices: HC$8.30

Standford Research Inst., Menlo Park, Calif.
DESIGN OF MICROWAVE FILTERS, IMPEDANCE-MATCHING NETWORKS, AND COUPLING STRUCTURES. VOLUME I,
by G. L. Matthaei, Leo Young, and E. M. T. Jones.
Jan 63, 531p
Contract DA36 039SC87398, Projs. 3A99 15 002 02 02 06, 3527

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Microwave networks, Impedance matching), (*Filters(Electromagnetic wave), Microwave equipment), (*Coupling circuits, Microwave equipment), Low-pass filters, High-pass filters, Band-pass filters, Delay circuits, Transmission lines, Measuring devices(Electrical + electronic), Measurement, Tuned circuits, Transformers, Mathematical analysis, Bandwidth, Design, Textbooks, Communication theory.

Design techniques are presented for a wide variety of low-pass, band-pass, high-pass, and band-stop microwave filters; for multiplexers; and for certain kinds of directional couplers. Most of the design procedures described make use of either a lumped-element low-pass prototype filter or a step-transformer prototype as a basis for design. Prototype filter designs are tabulated, and data is given relevant to the use of prototype filters as a basis for the design of impedance-matching networks and time-delay networks. Design formulas and tables for step-transformer prototypes are also given. The design of microwave filter structures to serve as impedance-matching networks is discussed. The design of microwave filters to achieve various time-delay (or slow-wave) properties is also discussed. Various equations, graphs, and tables are collected relevant to the design of coaxial lines, strip-lines, waveguides, parallel-coupled lines between common ground planes, arrays of lines between ground planes, coupling and junction discontinuities, and resonators. Techniques for measuring the Q's of resonators and the coupling coefficients between resonators are also discussed, along with procedures for tuning filters. (Author)

AD-403 528 Field 9A
CFSTI Price: HC$3.00

Bendix Corp., Davenport, Iowa. Pioneer-Central Div.
RESEARCH WORK FOR FREQUENCY TEMPERATURE COMPENSATION TECHNIQUES FOR QUARTZ CRYSTAL OSCILLATORS.
Quarterly rept. no. 2, 1 Oct-31 Dec 62,
by Richard H. Bangert. 19 Apr 63, 92p
Rept. no. 2644-63
Contract DA36 039SC90782

Unclassified report

Descriptors: (*Crystal oscillators, Temperature sensitive elements), (*Temperature sensitive elements, Crystal oscillators), Quartz, Semiconductor devices, Thermistors, Diodes(Semiconductor), Avalanche diodes, Electric bridges, Transistors, Aging(Materials), Mathematical analysis, Temperature control.

The different methods of frequency-temperature compensation (varicap, transistor and isolation stage, binistor, and capacitor-diode) are discussed. New techniques and approaches to compensation of crystal oscillators are presented, and mathematical analyses are developed for each. Empirical data is presented indicating the characteristics of each compensation method. A method of obtaining negligible effect of B+ voltage changes is presented. Several new approaches to voltage control/networks are discussed, including a bridge voltage and current control/network that is applicable to both the varicap and capacitor-diode method. Aging data on four oscillators is presented which is a continuation of the aging tests started during the first quarter of this contract. The aging oscillators were temperature cycled and the original frequency-temperature characteristics were compared to the characteristics obtained. (Author)

AD-412 741 Field 9A
CFSTI Price: HC$2.00

Shockley Lab., Clevite Corp., Palo Alto, Calif.
VHF SILICON POWER TRANSISTOR.
Quarterly rept. no. 3, 1 Jan-31 Mar 63,
by R. M. Scarlett. 31 Mar 63, 31p
Contract DA36 039SC90837, Proj. 3A99 21 001

Unclassified report

Descriptors: (*Transistors, Radiofrequency power), Very high frequency, Silicon, Mathematical prediction, Mathematical models, Fixed contacts, Electrical properties, Resistors, Semiconducting films, Aluminum, Gain.

A theory for the large-signal high-frequency operation of power transistors is presented, and effects limiting the power output are analyzed. One of these is the voltage drop in the collector body caused by the high current concentration produced by 'emission crowding'. The other is the large current that may flow when the transistor should be cut off, resulting from forward bias on the base-emitter junction produced by charging the collector capacitor. Calculations are made showing that the former effect is very serious in the present transistor, and that a lower base sheet resistance is necessary to improve the rf efficiency. (Author)

AD-422 199 Field 9A, 13H, 20B, 20L
CFSTI Price: HC$3.00

Lansdale Div., Philco Corp., Pa.
RESEARCH AND DEVELOPMENT EPITAXIAL OVERGROWTH STRUCTURES IN SILICON.
Final progress rept. for 15 Apr 62-15 Jun 63,
by G. Schnable. 15 Jun 63, 95p
Contract DA36 039sc89070, Projs. 3A99 21 001, R114 1

Unclassified report

Descriptors: (*Semiconductor devices, Silicon), (*Silicon, Epitaxial growth), (*Semiconductors, Silicon), Crystal growth, Diodes(Semiconductors), Transistors, Etched crystals, Electrical properties, Impurities, Diffusion, Boron, Phosphorus, Antimony, Bibliographies, Vapor plating.

Effort was directed toward the preparation and delivery of multilayer epitaxial overgrowth structures in silicon, including 2-layer, 3-layer, 4-layer and more complex structures. The material was designed for use in fabrication of all-epitaxial transistors, double-diffused pnip transistors, voltage-variable capacitance diodes and other components. Wafers supplied included structures having epitaxial layers with graded impurity concentration, and wafers prepared by oxide masking of selected areas during HCl etching or during deposition of epitaxial silicon. Structures were also prepared by preferential growth of epitaxial silicon through holes in an oxide mask, followed by reoxidation and a second preferential growth. (Author)

AD-426 050 Field 9A
CFSTI Price: HC$2.00

Motorola, Inc., Phoenix Ariz. Semiconductor Products Div.
THIN FILM TECHNIQUES FOR SILICON INTEGRATED CIRCUITS.
Quarterly progress rept. no. 1, 15 Jun-15 Sep 63, by Eugene Blanchette and Richard Wilson. 15 Sep 63, 33p
Contract DA36 039AMC02342E
Unclassified report

See also PB-167 613.

Descriptors: (*Integrated circuits, Semiconductor films), (*Semiconductor films, Integrated circuits), (*Transistors, Integrated circuits), Silicon, Resistors, Capacitors, Aluminum compounds, Silicon compounds, Dielectric films, Tantalum capacitors, Nickel alloys, Chromium alloys, Metal films, Vapor plating, Vacuum apparatus, Chemical milling, Sandwich construction, Molecular electronics, Impurities, Photoengraving.

The transistor for studying the effect of thin film processing on device characteristics has been selected. Initial work is being done on resistors and capacitors and this progress is reported. Considerations for selecting a circuit vehicle are included. The Integrated Control Pattern Concept is explained. (Author)

AD-430 958 Field 9A
CFSTI Price: HC$1.00

General Telephone and Electronics Labs., Inc., Bayside, N. Y.
SEMICONDUCTOR MICROWAVE AMPLITUDE AND PHASE MODULATOR.
Quarterly rept. no. 2, 15 Aug-15 Nov 63, by R. Harrison, J. Zucker, F. Drago, and D. Fleri. 15 Nov 63, 20p Rept. no. TR-63-103.2
Contract DA36 039AMC02284E, Proj. 3A99 21 001
Unclassified report

Descriptors: (*Semiconductor devices, Modulators), (*Modulators, Semiconductor devices), Phase modulation, Amplitude modulation, Microwave equipment, Millimeter waves, Extremely high frequency, Propagation, Electromagnetic fields, Configuration, Waveguide irises, Waveguides, Bandwidth, Resonance, Numerical analysis, Attenuation.

Research was continued on the development of a semiconductor microwave amplitude and phase modulator that makes use of the interaction of propagating electromagnetic fields with injected carriers in a semiconductor medium for application at a wavelength of 4.28 millimeters. A more flexible modulator configuration was analyzed in which adjustable susceptive irises were added to the semiconductor-loaded waveguide structure previously treated. In this new configuration resonance is no longer dependent solely on the semiconductor length. Numerical computations indicate that the structure with irises can provide somewhat lower insertion loss than that without irises but otherwise exhibits the same essential features. The possibility of realizing modulation bandwidths up to 1 mc was demonstrated in a reduced height test structure.

AD-431 161 Field 9A
CFSTI Price: HC$2.00

Hamilton Standard Div., United Aircraft Corp., Broad Brook, Conn.
THERMAL DESIGNS FOR MICRO-MODULES.
Quarterly rept. no. 2, 1 Aug-1 Nov 63, by P. C. Taudvin and R. J. Green. 1 Nov 63, 46p
HSER-2696
Contract DA36 039AMC02172E
Unclassified report

Descriptors: (*Modules(Electronics), Microminiaturization(Electronics)), (*Microminiaturization(Electronics), Modules(Electronics)), (*Temperature control, Microminiaturization(Electronics)), (*Temperature sensitive elements, Microminiaturization(Electronics)), Beryllium compounds, Thermistors, Thermocouples, Aluminum compounds, Silicates, Metal films, Vapor plating, Resistors, Temperature, Tests, Test methods, Encapsulation, Epoxy plastics, Oxides.

Fabrication of resistors on beryllia presented a problem both in the deposition and scribing processes. The surface smoothness of these wafers was not comparable to the alumina wafers and the original deposition processes had to be altered to satisfactorily deposit a thin film layer. Because of the heat conductivity of the beryllia, electron beam scribing of these wafers required a much larger beam energy at the cutting surface to isolate the resistive paths on the thin film. Utilizing alumina substrates on hand, a single unit was fabricated to check out all anticipated manufacturing processes. Eight alumina and two beryllia preliminary modules were fabricated. Difficulties were encountered in manufacturing the latter. These modules were thermally tested in the unencapsulated state. Erratic results were obtained with one of the alumina modules and this unit was removed from further testing. Experimental radiator and lug models were made and soldered to plated surfaces to demonstrate feasibility of the design and the joining method. For the fabrication of the modular assembly, all wafers have had area resistors deposited on them.

AD-441 184 Field 9A
CFSTI Prices: HC$5.00

Lincoln Lab., Mass. Inst. of Tech., Lexington.
WJ-266 Ka-BAND 1000 OMEGA CW TRAVELING WAVE TUBE AMPLIFIER, PARTS DRAWINGS, ASSEMBLY DRAWINGS AND PARTS LIST.
30 Sep 63, 177p
Contract AF19 628 500
Unclassified report
ESD TDR-64-423

Subcontracted to Watkins-Johnson Co., Palo Alto, Calif.
Available copy will not permit fully legible reproduction.

Descriptors: (*Traveling wave tubes, Mechanical drawings), (*Mechanical drawings, Traveling wave tubes), K-band, Microwave amplifiers, Catalogs, Electron tube parts.

AD-448 494 Field 9B
CFSTI Price: HC$1.00

Stelma, Inc., Stamford, Conn.
DEVELOPMENT OF (PCM) DATA BUFFERS.
Quarterly progress rept. no. 4, 18 Apr-11 Jul 64, by W. Ciecierski. 11 Jul 64, 21p
Contract DA36 039AMC03186E, Proj. DA36 039AMC
Unclassified report

See also AD-601 097.

Descriptors: (*Digital systems, Design), (*Data transmission systems, Design), (*Input-output devices, Data transmission systems), Coding, Multiplex, Pulse modulation, Synchronization(Electronics), Gates(Circuits), Computer logic, Mechanical properties, Tests, Printed circuits, Electric cables, Temperature, Mechanical drawings, Timing devices, Inverter circuits, Relaxation oscillators.

The purpose of this project is the design and construction of two advanced development models of a low-speed and a high-speed converter (PCM Buffer), digital-to-digital--each for inserting a number of digital data channels into Data I or Data II of the PCM Multiplexers TD-352( )/U or TD-353 ( )/U. The High-Speed Buffer must be capable of handling synchronous and asynchronous data; the Low-Speed unit, synchronous data only. Final circuit, logic and mechanical design of the High-Speed Buffer was completed. A slight modification eliminates a possible lock-up state upon initial power application in the Receiver. Check-out of an assembled Card Nest of the Receiver and Transmitter was started. Printed-circuit harness card layout was completed. Except for the transit case, mechanical design was completed. Preliminary design of the Low-Speed Buffer was completed. Basic logic cards (Bistable, NAND and NOR gates) are undergoing temperature and loading tests. Printed-circuit harness card layout was completed. (Author)

AD-450 300 Field 9A, 10A
CFSTI Prices: HC$6.00

Electron Physics Lab., Univ. of Michigan, Ann Arbor.
ENERGY EXCHANGE IN CROSSED-FIELD SYSTEMS,
by Klaus L. Volkholz. Jun 64, 238p
Technical rept. no. TR-73, 05361-9-T
Contract DA36 039AMC00027E, Projs. 05361, 3A99 13 001 01

Unclassified report

Descriptors: (*Crossed field devices, Energy conversion), Army research, Nonlinear differential equations, Electron beams, Electric fields, Magnetic fields, Distribution theory, Energy, Microwave amplifiers, Optimization.

The optimization of crossed-field systems is studied from the viewpoint of power output and efficiency by using variable-pitch slow-wave circuits and depressed collectors. The nonlinear equations describing energy exchange between an electron beam and an r-f wave are derived, valid for variable phase velocity and variable electron beam velocity. These equations are simplified with the hard-kernal-bunch assumption which makes it possible to obtain closed-form solutions for the conversion of potential energy alone, the conversion of kinetic energy alone, and the combined conversion of potential and kinetic energy into r-f energy. The phase-velocity variations and the concurrent change in electron beam velocity which are required to maximize power output are derived from the theory and presented for various parameters. Closed-form solutions are obtained for a beam model involving a continuous distribution of charge. The theory of bar lines is extended through the closed-form summation of the bar-line admittance function, using a contour integration in the complex plane. Experimental evidence from a high-power crossed-field amplifier is given and the performance of uniform and tapered circuits is compared. (Author)

AD-451 004 Field 9A, 20L
CFSTI Prices: HC$3.00

Philco Corp., Blue Bell, Pa.
METAL BASE TRANSISTOR.
Rept. no 4 (final) 1 Apr-30 Jun 64,
by Walter Kane. 15 Aug 64, 96p
Contract DA36 039AMC02373E, Task 3A99 21 003

Unclassified report

Descriptors: (*Transistors, Semiconducting films), (*Semiconducting films, Transistors), Photons, Transport properties, Electrons, Electron microscopy, Metal films, Thickness, Gold, Electrical properties, Surface properties, Heat treatment, Crystal lattice defects, Sandwich construction, Zinc compounds, Sulfides, Atomic energy levels, Cadmium compounds, Diodes(Semiconductor), Aluminum, Gain, Electrodes.

The purpose of this work was to evolve an active solid-state thin-film electronic device with usable power gain, based on the transport of hot electrons across a thin metal-base film, the electrons being injected into the metal base film by means of a Schottky barrier. Electrical measurements and electron micrographs show that the properties of thin evaporated fold films are independent of deposition rate in the range studied (5 to 125 angstroms) and depend only on thickness. Unannealed films having thicknesses ranging down to approx. 100 angstroms exhibit deviations from bulk electrical properties which can be explained in terms of surface reflection of electrons. Below approx. 100 angstroms the films agglomerate and become discontinuous. Annealing of the gold film causes agglomeration. Island formation in films sandwiched between zinc sulfide layers is as severe as in uncoated films, but in the former case, narrow bridges of gold are found connecting the islands.

AD-454 608 Field 9A
CFSTI Prices: HC$1.00

Microwave Electronics Corp., Palo Alto, Calif.
DESIGN AND DEVELOPMENT OF THREE-WATT K(u)-BAND TRAVELING-WAVE TUBE.
Interim development rept. no. 5, 1 Jul 63-28 Feb 64. Mar 64, 24p
Contract NObsr87501, Proj. SR0080304, Task 9293

Unclassified report

Descriptors: (*Traveling-wave tubes, K-band), Packaging, Waveguide couplers, Temperature, Impedance matching, Helixes, Radiofrequency power, Tests, Tables.

The package design was completed to include finalizing of the waveguide coupling and the temperature compensation resulting in the M5046 meeting all electrical and environmental specifications.

N65-17451 Field 9E, 22B
CFSTI Prices: HC$3.00 MF$0.50

Michigan Univ., Ann Arbor.
STUDIES OF ANTENNAS FOR SPACE VEHICLES,
by P. L. E. Uslenghi. Mar 65, 48p
Grant NsG444
NASA CR-159

Unclassified report

Descriptors: (*Antennas, Spacecraft), (*Spacecraft, Antennas).

N65-20477 Field 9E, 1D
CFSTI Prices: HC$2.00 MF$0.50

Bunker-Ramo Corp., Canoga Park, Calif.
ON THE INVERSE OPTIMAL CONTROL PROBLEM IN MANUAL CONTROL SYSTEMS,
by R. W. Obermayer and F. A. Muckler. Apr 65, 29p
Contract NASw869
NASA CR-208

Unclassified report

Descriptors: (*Control systems, Optimization), Theory.

Patent 3,177,447 Field 9A

TRANSISTOR MAGNETIC-CORE MULTIVIBRATOR WITH CONSTANT CURRENT OUTPUT.
Patent assigned to Navy,
by William A. Geyger. 6 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Relaxation oscillators, Magnetic amplifiers), (*Magnetic amplifiers, Relaxation oscillafors), Transistors, Saturable reactors, Patents.

The magnetic amplifier is supplied by an alnating current voltage from a transistor magnetic core multivibrator. An inductor is provided in the input circuit of the magnetic amplifier. The inductor is in the bias circuit in order to compensate for the effects of variations in the potential of the D.C. voltage source of the multivibrator.

Patent 3,178,659 Div. 9A

MICROWAVE SWITCH HAVING DIODES SITUATED IN THE WAVEGUIDE CHANNELS TO CONTROL COUPLING BETWEEN COMMON AND BRANCH CHANNELS.
Patent assigned to Navy,
by John V. Smith and George W. Luke, Jr. 13 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Waveguide switches, Diodes(Semiconductor)), (*Diodes(Semiconductor), Waveguide switches), Patents, Microwave equipment, Dielectrics.

The waveguide switch structure includes a plurality of waveguide arms. Each arm has an end in contiguous relationship with an end on each of the other arms. An input wave coupler is common to the arms. A diode crystal is located in each arm. A dielectric sleeve surrounds the diode for increasing the isolation effect of the diode.

Patent 3,179,942 Field 9E, 1D

ANTENNA STABILIZING APPARATUS.
Patent assigned to Army,
by Erick L. Hanson. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Aircraft antennas, Stabilization systems), Design, Radar antennas, Patents.

The antenna is fixed to an aircraft and is subject to deviation from level flight. The stabilizing apparatus compensates for any deviation from normal flight caused by pitch, roll or yaw. The apparatus includes bars and spherical bearings, a hydraulic system and a gyro servo system.

Patent 3,181,038 Field 9A, 1C, 19E

CONTROL CIRCUIT FOR SWITCHING DEVICE.
Patent assigned to Navy,
by Leo E. Feldhake. 27 Apr 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Remote control systems, Rotary switches), (*Rotary switches, Remote control systems), Airborne, Armament, Weapons, Patents.

The device is utilized on an aircraft by the pilot to 'switch in' various parameters in armament weapons. A rotary solenoid is provided to drive a gang of rotary, wafer-type switches in response to a remotely positioned control switch. Upon movement of the control switch, an unbalanced voltage condition is created, and a pair of transistors are made to conduct and, in turn, actuate a relay which permits the rotary solenoid to be energized. The rotary solenoid rotates the gang of rotary switches until a balanced voltage condition is reached. A bridge rectifier is provided in order to insure a polarized signal to the transistors.

Patent 3,181,045 Field 9A

TUNING VARIABLE CAPACITOR.
Patent assigned to Navy,
by Irwin M. Bruntil and Jonas M. Shapiro. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Variable capacitors, Frequency stabilizers), Patents, Crystals, Stabilization, Automatic, Tuning devices.

The piston capacitor is useful in a circuit arrangement for automatically stabilizing the frequency of a crystal over extended periods of time without any need for adjustment. The crystals are used in temperature controlled ovens. Capacitance is altered by the capacitor which has a cylinder type element into which a second member may be rotated by screw threads.

Patent 3,181,071 Field 9A

APPARATUS FOR QUIETING PLATE PULSED UHF OSCILLATORS.
Patent assigned to Navy,
by Richard A. Smith, Thomas F. Christy and Thomas E. Adams. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Pulse modulation, Radiofrequency oscillators), (*Radiofrequency oscillators, Pulse modulation), Ultrahigh frequency, Patents.

The apparatus pulse modulates a radio frequency UHF oscillator. The method of modulation includes pulsing the plate circuite of an oscillator with a pulse which has a plateau preceding the main body of the pulse. The duration of the plateau portion of the pulse is about the same length as the duration of the main body of the pulse.

Patent 3,181,076 Field 9A

CLIPPING CIRCUIT EMPLOYING TWO TUBES COUPLED TOGETHER BY DIODE IMPEDANCE NETWORK AND VARIABLE BIAS CONTROL MEANS.
Patent assigned to Navy,
by William L. Freseman and Frank H. Stephens, Jr.
27 Apr 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Clipper circuits, Broadband), Design, Patents.

The clipper-selector circuit is used in magnetic amplifiers, power amplifiers and in iso-echo contour devices such as radar systems for mapping, weather systems, and the like. The circuit includes two electron tubes, a unidirectional current controlling component, an impedance network and an arrangement for adjusting the control grid bias on the second tube. The bias adjustment determines the clipping level.

Patent 3,182,115 Field 9A

LARGE-POWER DISSIPATING TRANSISTOR MOUNTING.
Patent assigned to Navy,
by Stephen F. Moran and William E. Ballard.
4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Transistors, Mounting brackets), (*Mounting brackets, Transistors), Supports, Electric insulation, Heat transfer, Patents.

The transistor mounting is adapted to support large-power-dissipating transistors of the type having a threaded base. The mounting structure includes a 'hard-anodized' metal electrically-insulating member through which heat is conducted to a 'heat sink' portion of the mounting where the heat transferred is readily dissipated.

Patent 3,182,225 Field 9A

SOLE FOR M-TYPE TRAVELLING WAVE TUBES.
Patent assigned to Army,
by Maurice Favre. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Travelling-wave tubes, Electron tube parts), Cathodes(Electron tube), Electrodes, Reliability-(Electronics), Patents, Containers, Bodies of revolution, Molybdenum, Tantalum, Coaxial cables.

The M-type traveling wave tube is provided with a circular sole in which the connection, particularly the connections to the cathode are so arranged as to minimize the possibility of arcing in the tube. The connections of the sole and of the cathode may leave the tube axially in the form of a coaxial line in which the connections to the cathode pass on the inside of those leading to the sole.

Patent 3,182,280 Field 9A, 13H

PROTECTION OF ELECTRICAL CONNECTOR CONTACT PINS.
Patent assigned to AEC,
by Francis X. Daut and Ralph O. Work. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D. C., 20231, $0.25

Descriptors: (*Electric connectors, Handling), Electric cables, Electric insulation, Patents, Processing, Manufacturing methods.

The connector is of the type having mating male and female parts, including a plurality of contact pins in one member and sockets in the other. A structure, or protector, is provided for holding connector contact pins in position during connector processing, that is, when wires of cable assemblies are being attached to contact pin solder cups and subsequently wrapped, and/or while cable assemblies are being molded or potted to the connector.

Patent 3,182,284 Field 9A, 13J

INTERLEAVED ELECTROACOUSTICAL TRANSDUCER.
Patent assigned to Navy,
by Charles E. Green. 4 May 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Electroacoustic transducers, Submarines), Piezoelectric crystals, Ship hulls, Ship decks, Submarine hulls, Phase shifters, Patents.

The transducer is utilized as a sound source or projector in submarine use. It is made of a stack of piezoelectric elements, each of which is successively and alternately interleaved with the others. The units are held together by a shaft. An extension of the shaft may be used for mounting the structure on the deck or hull of a ship or submarine. A phase shifter circuit is shown with the transducer.

PB-167 390 Field 9E, 17I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Syracuse, N. Y. Heavy Military Electronics Dept.
SYNTHETIC APERTURE ANTENNA INVESTIGATION.
Quarterly technical note no. 1, 8 Jul-30 Sep 60,
by W. B. Adams, P. W. Howells, B. R. Mayo, and W. D. Nelson. Sep 60, 61p
Contract AF30 602 2323, Proj. 4506, Task 45389
RADC TN-60-259; AD 248 592 Unclassified report

Descriptors: (*Radar antennas, Mathematical analysis), (*Radar, Mathematical models), Synthesis, Radar equipment, Antenna radiation patterns, Dipole antennas, Doppler radar, Functions, Performance(Engineering), Radar signals.

A general mathematical model of a linear radar system is developed. In this model the antenna is treated as a two-port filter whose transfer function contains the spatial angles as parameters. The mathematical model allows the calculation of the radar system performance for arbitrary transmit waveforms and arbitrary antenna transfer functions. The time-domain and frequency-domain impulse responses of the uniformly-illuminated continuous aperture, the cosine-tapered continuous aperture, the electric dipole, the magnetic dipole, and the three-dimensional array of elements are developed. The spatial configuration of an array which has the same one-way transfer function as the two-way transfer function of a given array is shown to be given by the convolution of the spatial configuration of the given array with itself. The mathematical model is used to calculate the pattern of a continuous array excited by a simple pulse which is short compared to array length. The pattern is shown to be normal in the region near boresight but radically different from the normal pattern for angles for off boresight. A linear array is proposed: (1) which uses a pulse that is short compared to the array length and (2) which requires a reduced number of elements. (Author)

PB-167 487 Field 9A, 13H
CFSTI Prices: HC$2.00 MF$0.50

General Telephone and Electronics Labs., Inc., Bayside, N. Y.
STUDY OF THIN FILM COMPOUNDS FORMED FROM SIMULTANEOUSLY EVAPORATED CONSTITUENTS.
Final rept. for 1 Jun 61-31 May 63, by A. K. Hagenlocher and A. E. Feuersanger.
31 Jun 63, 51p TR-63-5.8G
Contract DA36 039SC87302, Proj. 3A99 15 001
AD 416 728
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Ceramic capacitors, Titanates), (*Barium compounds, Titanates), (*Films, Capacitors), (*Capacitors, Preparation), Vapor plating, Low pressure research, Oxygen, Evaporation, Electron guns, Electronic equipment, Instrumentation, Oxides, Platinum, Rhodium, Heat treatment, Sapphires, Surfaces, Electrical properties, Capacitance, Resistance(Electrical), Temperature.

Thin films of barium titanate suitable for forming thin-film capacitive structures were prepared by the simultaneous evaporation of barium and titanium oxide in an oxygen atmosphere. The experimental conditions for the synthesis of these films were determined in a specially designed deposition system. The current procedure for film synthesis is given in detail. The structural, compositional and electrical properties of the films are described. Test thin-film capacitors on platinum-rhodium substrates with capacitances as high as 1.6 microfarads/sq. cm. were prepared. (Author)

PB-167 515 Field 9D
CFSTI Prices: HC$7.20 MF$2.25

Systems Research Center, Case Inst. of Tech., Cleveland, Ohio.
GENERALIZED ASPECTS OF NOISELESS, DISCRETE FINITE-STATE CHANNELS,
by Charles E. Radke. 1963, 418p
SRC-48-A-64-16
Grants NSF GP658, NSF GP2122
Unclassified report

Descriptors: (*Communication theory, Coding), (*Coding, Optimization), Probability, Pattern recognition, Statistical processes, Matrix algebra.

The problem of coding noiseless finite-state channels is discussed for the case in which the code set is constrained to obey the prefix criterion or its inverse, the suffix criterion. The source of the messages has a finite-state Markovian behavior. The problem is divided into two classes. In the first class a Markov source of messages and finite-state uncoded channel are specified. A prefix or suffix code set is desired such that the coding efficiency is maximized. Previously, in literature solutions had been restricted to the single-state case. Methods are developed which solve this first class of problems completely. In the second class only the Markov source, the coding criterion, and the maximum number of allowed states in the channel are specified. The problem is to choose a channel and compatible code set which maximize the coding efficiency. A heuristic method is presented to find a 'satisfactory' uncoded channel. On the basis of this channel the problem is reduced to one of the first class. The approach to both classes of problems utilizes matrix methods rather than strictly combinative procedures. The research establishes a number of isolated facts which were previously either unknown or only conjectured. (Author)

PB-167 589 Field 9A, 12A
CFSTI Prices: HC$3.00 MF$0.75

Stanford Electronics Labs., Stanford Univ., Calif.
ALGEBRAIC SYNTHESIS OF SWITCHING NETWORKS,
by R. W. Edwards. Apr 63, 80p
Technical rept. nos. TR-2205-1, SEL-63-029
Unclassified report

Prepared under contract with Bell Telephone Labs., Inc.

Descriptors: (*Switching circuits, Synthesis), (*Algebra, Switching circuits), Digital systems, Computer logic, Networks, Sequence switches, Mapping(Transformations), Polynomials, Groups(Mathematics), Field theory, Sequential analysis.

Finite algebraic systems are used to synthesize switching circuits. Several canonic circuit forms having iterative structures are determined, and some relations between the operation and organization of digital systems are established. The synthesis procedure developed in this study has three steps. The states of a sequential machine are coded with the elements of a finite field. The transitions of the machine are expressed analytically by a mapping polynomial whose coefficients are in the field. A switching circuit is designed whose organization is simply related to the form of the mapping polynomial. Just as with traditional methods of logical design, successful application of this method depends on making a good assignment of field elements to the states of the machine, and in choosing the organization of the logic network. Investigation of alternatives and their implications thus constitutes the major portion of the study. The theory of finite groups is used to define some important relations between the symmetries of state graphs and the structure of switching networks. Special classes of circuits are found in which these relations are particularly simple. (Author)

PB-167 591 Field 9C, 12A
CFSTI Prices: HC$4.00 MF$1.00

Stanford Electronics Labs., Stanford Univ., Calif.
NONLINEAR-SYSTEM ANALYSIS AND SYNTHESIS,
by Ming-Lei Liou. Oct 63, 150p
Technical rept. nos. TR-6554-6, SEL-63-095
Grant NSF GP520 Unclassified report

Descriptors: (*Nonlinear systems, Synthesis), (*Functional analysis, Nonlinear systems), (*Electronics, Nonlinear systems), Linear systems, Power series, Mathematical models, Operators-(Mathematics), Nonlinear differential equations, Integral transforms, Special functions(Mathematical), Feedback.

The analysis and synthesis of a special class of nonlinear systems composed of time-invariant linear systems and zero-memory nonlinear systems are considered. The functional power series is chosen as the basic mathematical model of such nonlinear systems. A nonlinear system operator is related to the functional power series. A novel method of solving a class of ordinary nonlinear differential equations using the concept of inverse system operators is developed. Several techniques are presented in the design of nonlinear compensators in nonlinear feedback systems under certain input-output constraints or performance criteria. A systematic synthesis method of nonlinear systems using multidimensional Laplace transforms is presented. Another synthesis method using orthonormal linear systems and zero-memory nonlinear systems based on a set of measured data is also presented. This method is valid only for a specifically defined class of input functions such as step functions, sinusoidal functions, etc. A general definition of equivalent nonlinear systems is given, unifying various concepts and interpretations of equivalent systems. (Author)

PB-167 610 Field 9A
CFSTI Prices: HC$3.00 MF$0.75

Signetics Corp., Sunnyvale, Calif.
FUNCTIONAL CIRCUIT UNITS.
Quarterly progress rept. no. 2, 1 Nov 63-30 Jan 64,
by E. Aoki, O. Baker, J. Fulton, and D. McKenzie.
30 Jan 64, 71p
Contract DA36 039AMC03269E
AD 437 147

Unclassified report

Descriptors: (*Vibrators(Electrical), Circuits), (*Printed circuits, Design), Modules(Electronic), Performance(Engineering), Gates(Circuits), Voltage, Electric currents, Diodes(Semiconductor), Delay circuits, Epitaxial growth, Transistors, Silicon, Digital systems, High frequency.

Progress was made toward the development of a compatible family of high speed, low power, digital functional circuit units employing silicon planar transistor technology. The basic circuits to be included in the family are (a) a standard gate, (b) a bistable multivibrator, (c) a power gate, (d) a delay element, and (e) a dual gate. The logic elements will be capable of working at systems speeds up to 10 Mc at -20C to +55C and at systems speeds of 5 Mc at -55C to +125C. The monostable multivibrator design was completed and epitaxial units are being processed. Data taken on an integrated mockup is presented. The Bistable multivibrator design which has followed that of the monostable multivibrator, was completed and masks are being fabricated. The standard gate was fabricated using epitaxial techniques, units were evaluated, and data is presented. The Power Gate is in the design and mockup evaluation phase. (Author)

PB-167 613 Field 9A
CFSTI Prices: HC$3.00 MF$0.75

Motorola, Inc., Phoenix, Ariz. Semiconductor Products Div.
THIN FILM TECHNIQUES FOR SILICON INTEGRATED CIRCUITS.
Quarterly progress rept. no. 2, 15 Sep-15 Dec 63,
by Eugene Blanchette, Richard Wilson, and Curtis Phillips. 15 Dec 63, 55p
Contract DA36 039AMC2342E Unclassified report
AD 436 787
See also AD-426 050.

Descriptors: (*Integrated circuits, Semiconductor films), (*Semiconductor films, Integrated circuits), Transistors, Silicon, Resistors, Capacitors, Nickel alloys, Chromium alloys, Cermets, Tantalum, Rhenium, Aluminum compounds, Silicates, Silicon compounds, Oxides, Metal films, Sandwich construction, Vapor plating, Chemical milling, Impurities, Glow discharges, Processing, Coatings.

Circuit design and masks for the R-C circuit vehicle have been completed, as well as processing of the adapter network and special control pattern. Analysis of data and failure from the frist run of the adapter are included. Processing of samples for Phase II is in progress. Further study is planned in the areas of contacting cermet resistors, deposition of nichrome, substrate cleanliness, aluminum silicate capacitor process and glow discharge anodization of capacitors. (Author)

PB-167 618 Field 9A
CFSTI Prices: HC$3.00 MF$0.75

Bell Telephone Labs., Inc., New York.
RESEARCH AND DEVELOPMENT OF HERMETICALLY SEALED RELAYS WITH ISOLATED CONTACTS.
Rept. no. 5 (final) for 1 Jul 61-15 Feb 64,
by C. Schneider and J. M. Alfiero. 15 Mar 64, 94p
Contract DA36 039sc87234, Proj. 3G26 09 031
AD 438 525

Unclassified report

Descriptors: (*Relays, Hermetic seals), Sliding contacts, Glass seals, Mercury, Environmental tests, Vibration, Electric currents, Magnetic fields, Shock-(Mechanics), Resistance(Electrical), Acceleration, Time, Temperature.

The purpose of this investigation was to provide models and performance information on relays and ferred devices employing glass sealed contacts. Single-make, dry reed sealed contacts were used in the ferreed devices, while single-make and three-element-transfer dry reed sealed contacts and mercury-wetted, position-independent, transfer sealed contacts were used in the relay models. Exploratory environmental tests were conducted on representative samples. The results of these studies as well as the operating characteristics of all samples furnished to the USAELRDL are presented. (Author)

PB-167 619 Field 9A
CFSTI Prices: HC$3.00 MF$0.75

Knights (James) Co., Sandwich, Ill.
PRECISION GLASS CRYSTAL UNITS.
Final rept. for 1 May 61-31 Jan 63,
by Louis A. Dick and Roger E. Bennett. 31 Jan 63, 61p
Contract DA36 039sc89268, Proj. 3G26 05 001
AD 437 822

Unclassified report

Descriptors: (*Quartz resonators, Crystal holders), (*Crystal holders, Quartz resonators), Medium frequency, High frequency, Aging(Materials), Stability, Temperature, Glass, Specifications, Heat-resistant glass, Bonding, Design.

The design of 1 to 5 mc crystal resonator units with Q's in the neighborhood of one million, enclosed in the HC-27/U glass holder (HC-6/U) is discussed. Emphasis is placed upon the reduction of losses. Data is given on 25 or more units at each of five frequencies: 1, 2, 3, 4, and 5 mc. Data is also given on stability vs. drive level, and on aging. (Author)

PB-167 635 Field 9E, 9A, 17I
CFSTI Prices: HC$3.00 MF$0.75

Microwave Associates, Inc., Burlington, Mass.
MINIATURIZED X-BAND STRIPLINE DUPLEXER.
Quarterly progress rept. no. 1, 1 Jul-30 Sep 63,
by James W. Christian. 30 Sep 63, 58p
Contract DA36 039AMC03230E, Task 1G6 22001A055 04
AD 430 868

Unclassified report

Descriptors: (*Radar duplexers, X band), (*Diodes-(Semiconductor), Radar duplexers), Miniature electronic equipment, Varactor diodes, Waveguide circulators, Ferrites, Limiters, Mixers(Electronic), Modules(Electronic), Containers, Theory, Design, Radiofrequency power, Waveguide couplers, Standing wave ratios, Silicon.

The objectives of this development program on a miniaturized X-band stripline duplexer are discussed in relation to the present state-of-the-art. General approaches to the problem are outlined. The various major elements of the

duplexer are discussed and the method of approach to the solution of each pertinent problem is analyzed. A broadband waveguide-to-stripline transition has been developed covering the frequency range of 9,200 to 9,700 megacycles. An experimental fixture has been constructed for the convenient testing of limiter modules. This fixture utilizes the broadband waveguide-to-stripline transition mentioned previously. A test fixture has been designed to evaluate the ferrite circulator module. Various transmission line configurations and a limited number of ferrite materials have been investigated. Studies are also underway on the development of a broadband TNC-to-stripline transition and a broadband directional coupler covering the 9,000 to 10,000 megacycle band. Preliminary experimental results show promise.

PB-167 636 Field 9A, 11B
CFSTI Prices: HC$3.00 MF$0.75

Corning Glass Works, N. Y.
DEVELOPMENT OF FIXED MULTILAYER CAPACITORS USING HIGH-K DEVITRIFIED GLASS DIELECTRIC.
Rept. no. 6(final) 1 May 62-31 Oct 63,
by Weston H. Jenkins. 31 Oct 63, 61p
Contract DA36 039SC89101, Proj. 3A99 15 002
AD 429 145
Unclassified report

Descriptors: (*Glass capacitors, Manufacturing methods), (*Dielectrics, Ceramic materials), (*Ceramic materials, Dielectrics), Gold, Electric terminals, Life expectancy, Performance(Engineering), Production, Heat treatment, Temperature, Voltage, Foils, Glass, Fixed capacitors.

Means were developed for forming glass ribbon for high dielectric constant glass-ceramic capacitors to thicknesses of .0015 to .002 in. with very short-lived alumina-coated rollers, and to thicknesses of .0023 - .003 in with durable beryllia rollers. Exploration of dielectric composition and electrode foil combinations led to the selection of composition X899COL, assembled with gold electrode foils. Heat treatment experiments established that best properties were obtained by the most rapid temperature rise obtainable, and that, apart from this, only the maximum temperature attained was important in determining dielectric properties of a given composition. It was demonstrated that stack pressing and heat treatment might be accomplished in a single operation. Recommendations for future work center around search for suitable long-life rollers and development of equipment for straightening the glass ribbon. When this is completed relatively large numbers of capacitors of final design should be fabricated and tested.

10. Energy Conversion (Non-propulsive)

AD-290 326 Field 10C
CFSTI Price: HC$2.00

Atomics International, Canoga Park, Calif.
DEVELOPMENT OF A LIGHTWEIGHT SECONDARY BATTERY SYSTEM.
Final rept. for 1 Dec 61-31 Jul 62,
by R. A. Osteryoung, R. L. McKisson, P. H. Dutch, G. Lauer, and E. B. Luchsinger. 15 Nov 62, 44p
Rept. no. 2, AI-7823
Contract DA36 039sc88925, ARPA Order 220 61
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Storage batteries, Electrochemistry), Resins, Polymers, Quinones, Polarographic analysis, Electrolytes, Electrodes, Lithium, Ions, Organic solvents, Electrolysis, Oxidation reduction reactions, Sulfoxides, Methyl radicals, Formamides, Anodes(Electrolytic cell), Cathodes(Electrolytic cell).

Procedures and results of a study to determine the feasibility of a novel lightweight secondary battery system are presented. The anode is a Li metal, Li ion couple. The cathode is an electron exchange resin based on quinone and the Li salt of hydroquinone. The electrolyte is a solution of Li salt in an organic solvent. Experimental work involved the synthesis of electrochemically active polymers and basic electrochemical behavior studies of model systems of benzoquinone and hydroquinone in solvents such as dimethylsulfoxide and dimethylformamide. A variety of hydroquinone-phenol-formaldehyde resins was prepared. Great difficulty was encountered in efforts to prepare a polyvinylhydroquinone polymer. Only a small amount of soluble polymer was ultimately obtained. Polarographic, chronopotentiometric, oscillopolarographic and constant potential electrolysis experiments were carried out on simple model quinone systems in a variety of solvents. The simple quinone appears to undergo two one-electron reduction steps which are reversible. The presence of Li ion apparently eliminates the second step of the reduction. Hydroquinone is oxidized with difficulty in the nonaqueous solvents used. Lithium may be expected to function satisfactorily as an anode material in nonaqueous solvents.

AD-401 872 Field 10B, 11C, 20F
CFSTI Price: HC$6.00

Spectrolab, North Hollywood, Calif.
INVESTIGATION OF OPTICAL COATINGS FOR SOLAR CELLS.
Final rept. for 1 Jun-10 Sep 62,
by R. J. Romagnoli. 10 Sep 62, 232p
Contract DA36 039SC87449, ARPA Order 80 61
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Solar cells, Optical coatings), (*Optical coatings, Solar cells), Solar radiation, Photoelectric cells(Semiconductor), Spectra(Visible + ultraviolet), Silicon, Focusing, Optical filters.

The use of concentrated and filtered solar radiation on silicon photovoltaic cells in solar power systems was investigated as a method of improving the performance and of reducing the weight and cost of such systems. The development of spectrally selective multilayer interference filters was undertaken. It was necessary to study the performance of the entire system as well as the performance characteristics of solar cells and filters. The investigation indicated that the efficiency of concentration obtainable with a reflection filter depends strongly upon the spectral properties of the filter. Elementary conditions of system design for optimum performance were established. A basic plan was outlined for fabrication of a prototype solar system with concentration and filtering. Filter performance characteristics were evaluated and specifications were formulated for suitable experimental mirror filters which might be fabricated to provide the desired concentration and filtering. Experimental mirror filters were fabricated and data was obtained on the effect of such mirror filters on solar power system performance. It can be concluded from this investigation that the use of concentration and filtering can afford valuable improvements in the cost and weight of solar power systems by increasing the power per cell. (Author)

AD-439 994 Field 10C
CFSTI Price: HC$1.00

Monsanto Research Corp., Everett, Mass.
RESEARCH ON ORGANIC DEPOLARIZERS.
Quarterly progress rept. no. 10, 1 Oct-31 Dec 63,
by Bernard A. Gruber and David L. Williams.
31 Dec 63, 24p MRB4006Q10
Contract DA36 039SC87336, Proj. 3A99 09 002
Unclassified report

Descriptors: (*Primary cells, Materials), (*Batteries and components, Primary cells), Electrolytes, Electric discharges, Capacitance, Polarization, Resistance (Electrical), Magnesium, Magnesium compounds, Bromides, Nitrobenzenes, Perchlorates, Carbon, Crystals, Electrodes, Battery separators.

Data was collected on the electronic and electrolytic conduction through C/DNB/Mg(C104)2 bobbins. AC and DC conduction measurements were compared with calculated electrolytic resistance, based on volume fraction of electrolyte. A method for preparing small DNB crystals was developed, in which a DNB-alcoholic solution is precipitated in water. The blending of these small DNB crystals with carbon gave a bobbin that had an extended useful discharge time compared with bobbins containing the larger DNB crystals. Discharge data at constant current were taken in which reference electrode probes were positioned within the discharging bobbin. (Author)

Patent 3,181,835 Field 10A, 21E

BLADE VIBRATION DAMPING DEVICE.
Patent assigned to Air Force,
by Carroll C. Davis. 4 May 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Vibration, Damping), (*Axial-flow compressor blades, Vibration), (*Turbine blades, Vibration), Patents, Turbojet engines.

The damping device is for damping the vibration of the blades in high speed fluid transfer machines such as turbojet engines and axial flow compressors. The damping device utilizes centrifugal force. Weights are utilized in slots for damping the rotating wheel.

PB-167 292 Field 10C, 11A
CFSTI Prices: HC$1.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
HOT WATER TEST FOR DETECTING AIR LEAKS IN THERMAL BATTERIES,
by G. Scillian and C. H. Emmons. 20 Nov 64,
41p Rept. no. TR-1176
Proj. 75300 Unclassified report
AD 454 070

Descriptors: (*Thermal batteries, Life expectancy), (*Life expectancy, Storage), Hermetic seals, Moisture-proofing, Tests, Sensitivity, Water, Degradation, Calcium, Anodes.

The 'hot water' test used for detecting minute leaks in thermal battery cases is described and evaluated. The rate at which water vapor can enter a battery through the minimum leak detectable by this test and the battery storage life expectancy at different geographical locations have been computed. It is concluded that the hot water test is sensitive enough to guarantee a 5-yr storage life for the two types of thermal batteries considered. Suggestions are given for extending the application of the test to other types. (Author)

PB-167 575 Field 10A, 10B
CFSTI Prices: HC$1.00 MF$0.50

SOVIET RESEARCH AND DEVELOPMENT ON THE UTILIZATION OF SOLAR ENERGY, 1958-64.
Jul 65, 21p PAL-65-1
Unclassified report

Descriptors: (*Solar radiation, Energy conversion), (*Energy conversion, USSR), Solar cells, Solar furnaces, Thermoelectricity, Cooling + ventilating equipment, Distillation.

Planning, administration, control, and decentralization of Soviet efforts in the field of solar radiation are discussed. Methods employed to convert directly from solar energy to electricity, including solar cells, thermoelectric generators, and solar heat engines, are considered. Solar water heating, cooling, distillation, cooking, drying, house heating, and heat storage are discussed.

PB-167 596 Field 10A, 9A, 20L
CFSTI Prices: HC$3.00 MF$0.75

Materials Research Corp., Orangeburg, N. Y.
THIN FILM TECHNIQUES IN THERMOELECTRICITY.
Semi-annual rept. for 20 Oct 62-31 Mar 63,
by G. Abowitz, A. Mountvala, E. Lancaster, V. Klints, and J. Varon. 24 May 63, 63p Rept. no. MRC-389
Contract NObs88212, Proj. SR007 12 01,
ARPA Order 219 61 Unclassified report
AD 418 672
Available copy will not permit fully legible reproduction.

Descriptors: (*Thermoelectricity, Thin films(Storage devices)), (*Generators, Thermoelectricity), (*Thermocouples, Thin films(Storage devices)), (*Semiconducting films, Thermoelectricity), Bismuth alloys, Tellurium alloys, Selenium alloys, Antimony alloys, Vapor plating, Lead alloys, Evaporation, Germanium alloys, Silicon alloys, Single crystals, Thermal conductivity.

Using vacuum evaporation techniques thin polycrystalline films of Bi-Te-Se and Bi-Sb-Te alloys were successfully and reproducibly deposited. The thermoelectric power and resistivity of both the n and p-type films are comparable to those of the bulk alloys. Thermoelectric modules with p-n junctions were prepared and evaluated. Results indicate that thermoelectric thin films of Bi-Te-Se and Bi-Sb-Te alloys have potential value as thermoelectric junction radiation detectors. Evaporation characteristics and resultant thermoelectric properties of PbTe and Ge-Si thin films were studied. With PbTe both n and p-type films can be obtained by proper control of evaporation parameters. Crystalline Ge-Si films were deposited on amorphous quartz substrates that have useful thermoelectric characteristics. The ultimate objective is the preparation of thin film modules for high voltage-low power thermoelectric generators. Some experimental techniques for the formation of single crystal films of useful thermoelectric materials were discussed. (Author)

11. Materials

AD-285 313 Field 11B, 21H
CFSTI Price: HC$3.00

Union Carbide Research Inst., Tarrytown, N. Y.
RESEARCH ON PHYSICAL AND CHEMICAL PRINCIPLES AFFECTING HIGH TEMPERATURE MATERIALS FOR ROCKET NOZZLES.

Quarterly progress rept. for 1 Jul-30 Sep 62,
by Robert Lowrie. 30 Sep 62, 73p
Contract DA30 069ORD2787
Unclassified report

Also includes Elastic Properties of Polycrystalline Tungsten at Elevated Temperatures, by B. T. Bernstein, and Hall Effect in Single-Crystal TiC, by John Piper, pub. in Journal of Applied Physics v33 n6 p2140 Jun 1962 n7 p2394-5 Jul 1962.

Descriptors: (*Rocket motor nozzles, Refractory materials), (*Refractory materials, Rocket motor nozzles), (*Carbides, Rocket motor nozzles), (*Borides, Rocket motor nozzles), Tungsten, Titanium compounds, Carbon dioxide, Reaction kinetics, Creep, Zirconium compounds, Hafnium compounds, Tantalum compounds, Corrosion, Oxidation, Graphite, Mass spectroscopy.

The program is concerned with the principles governing high-temperature chemical and physical behavior, especially in the respects that may contribute importantly to the successful performance of materials as rocket components operating at high temperatures. The major group of materials being studied consists of the refractory carbides and borides of the transition metals. A considerable effort is being devoted to the preparation of powders of these compounds with good purity and to their fabrication into test specimens without contamination.

AD-292 712 Field 11B, 21H
CFSTI Price: HC$3.00

Union Carbide Research Inst., Tarrytown, N. Y.
RESEARCH ON PHYSICAL AND CHEMICAL PRINCIPLES AFFECTING HIGH TEMPERATURE MATERIALS FOR ROCKET NOZZLES.
Quarterly progress rept. for 1 Oct-31 Dec 62,
by Robert Lowrie. 31 Dec 62, 65p
Contract DA30 069ORD2787, ARPA Order 34 62
Unclassified report

Prepared in cooperation with Parma Research Center, Cleveland, Ohio.
Available copy will not permit fully legible reproduction.
See also AD-274 186.

Descriptors: (*Rocket motor nozzles, Refractory materials), (*Refractory materials, Rocket motor nozzles), (*Carbides, Rocket motor nozzles), (*Borides, Rocket motor nozzles), Corrosion, Stresses, Vaporization, Creep, High-temperature research, Thermal conductivity, Tensile properties, Heat transfer, Specific heat, Chemical reactions.

The program is concerned with the principles governing high-temperature chemical and physical behavior, expecially in the respects that may contribute importantly to the successful performance of materials as rocket components operating at high temperatures. The major group of materials being studied consists of the refractory carbides and borides of the transition metals. A considerable effort is being devoted to the preparation of powders of these compounds with good purity and to their fabrication into test specimens without contamination.

AD-400 299 Field 11B, 21H
CFSTI Price: HC$3.00

Union Carbide Research Inst., Tarrytown, N. Y.
RESEARCH ON PHYSICAL AND CHEMICAL PRINCIPLES AFFECTING HIGH TEMPERATURE MATERIALS FOR ROCKET NOZZLES.
Quarterly progress rept. for 1 Jan-31 Mar 63,
by Robert Lowrie. 31 Mar 63, 85p
Contract DA30 069ORD2787, ARPA Order 34 63, Task 4
Unclassified report

Prepared in cooperation with Parma Research Center, Cleveland, Ohio.

Descriptors: (*Rocket motor nozzles, Refractory materials), (*Refractory materials, Rocket motor nozzles), Carbides, Borides, Titanium compounds, Hafnium compounds, Tantalum compounds, Carbon dioxide, Zirconium compounds, Niobium compounds, Heat of activation, Thermal conductivity, Reaction kinetics, Creep, Mass spectroscopy, Chemical reactions, High-temperature research, High-pressure research, X-ray diffraction analysis, Elasticity, Thermodynamics, Melting, Corrosion.

The program is concerned with the principles governing high-temperature chemical and physical behavior, especially in the respects that may contribute importantly to the successful performance of materials as rocket components operating at high temperatures. The major group of materials being studied consists of the refractory carbides and borides of the transition metals. A considerable effort is being devoted to the preparation of powders of these compounds with good purity and to their fabrication into test specimens without contamination.

AD-409 923 Field 11B, 21H
CFSTI Price: HC$3.00

Union Carbide Research Inst., Tarrytown, N. Y.
RESEARCH ON PHYSICAL AND CHEMICAL PRINCIPLES AFFECTING HIGH TEMPERATURE MATERIALS FOR ROCKET NOZZLES.
Quarterly progress rept. for 1 Apr-30 Jun 63,
by Robert Lowrie. 30 Jun 63, 66p
Contract DA30 069ORD2787, ARPA Order 34 63, Task 4
Unclassified report

Prepared in cooperation with Parma Research Center, Cleveland, Ohio.
Available copy will not permit fully legible reproduction.
See also AD-400 299.

Descriptors: (*Rocket motor nozzles, Refractory materials), (*Carbides, Rocket motor nozzles), (*Borides, Rocket motor nozzles), (*Refractory materials, Rocket motor nozzles), Corrosion, Carbon dioxide, Tungsten, Silver, Oxidation, Powder metallurgy, Zirconium compounds, Niobium compounds, X-ray diffraction analysis, Oxygen, Graphite, Composite materials, Reaction kinetics, Powders, Hafnium compounds, Tantalum compounds, Titanium compounds, Creep, Vacuum furnaces, High-temperature research.

The program is concerned with the principles governing high-temperature chemical and physical behavior, especially in the respects that may contribute importantly to the successful performance of materials as rocket components operating at high temperatures. The major group of materials being studied consists of the refractory carbides and borides of the transition metals. A considerable effort is being devoted to the preparation of powders of these compounds with good purity and to their fabrication into test specimens without contamination.

N65-19917 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.

SOLUBILITY OF IRON, NICKEL, AND COBALT IN LIQUID POTASSIUM AND EFFECT OF OXYGEN GETTERING AGENTS ON IRON SOLUBILITY,
by James H. Swisher. Mar 65, 11p
NASA-TN-D-2734

Unclassified report

Descriptors: (*Metals, Solubility), (*Potassium, Corrosive liquids), Iron, Nickel, Cobalt, Liquid metals, Oxygen.

N65-19921 Field 11D, 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
PRELIMINARY INVESTIGATION OF FILAMENT-WOUND GLASS-REINFORCED PLASTICS AND LINERS FOR CRYOGENIC PRESSURE VESSELS,
by Morgan P. Hanson, Hadley T. Richards, and Robert O. Hickel. Mar 65, 28p NASA-TN-D-2741

Unclassified report

Descriptors: (*Composite materials, Filament wound construction), (*Filament wound construction, Composite materials), Glass textiles, Cryogenics, Pressure vessels, Plastics.

Patent 3,178,368 Field 11H

PROCESS FOR BASIC SULFURIZED METAL PHENATES.
Patent assigned to California Research Corp.,
by Walter W. Hanneman. 13 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Preparation), (*Phenols, Salts), Metalorganic compounds, Sulfuration, Alkaline earth compounds, Hydroxides, Oxides, Glycols, Polyethylene plastics, Sulfonates, Carbonates, Calcium compounds, Patents.

Sulfurized calcium carbonated alkyl phenate containing excessive amounts of metal is incorporated in diesel engine lubricating oil as a detergent and neutralizing agent for oxidation products of the oil and fuel residues. An alkyl phenol, having from 4 to 30 carbon atoms in the alkyl radical, is reacted with calcium hydroxide and sulfur, and then carbonated in a blend of a lube oil, calcium aklyl aryl sulfonate, an aliphatic monohydric alcohol of from 8 to 18 carbon atoms, and ethylene glycol. The alkyl radical of the phenol component is derived from polypropylene having an average of 12 carbon atoms. The calcium mahogany petroleum sulfonate, from 0.01 to 0.05 mol per mol of phenol, and 50 percent of the original charge of from 10 to 50 percent by weight of phenol of the monohydric alcohol, remain in the composition, while the water of reaction and ethylene glycol are removed by heating.

Patent 3,179,531 Field 11I, 11D, 13H, 17I

METHOD OF COATING A LAMINATED PLASTIC STRUCTURE.
Patent assigned to Navy,
by Francis J. Koubek. 20 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Laminated plastics, Coatings), (*Radomes, Laminated plastics), Refractory coatings, Refractory materials, Composite materials, Sandwich construction, Glass textiles, Guided missiles, Aircraft, Patents.

The laminated plastic material is used as a material of construction for radomes on high speed aircraft and missiles. The laminated plastic structure is formed of alternate layers of a resinous material and layers of fiberglass. The coating is formed upon the laminated structure by incorporating refractory material in the top most resinous layer. The laminate-refractory composite is then cured and a refractory coating is applied by flame spraying and heat-treating.

Patent 3,180,742 Field 11A, 1C, 11B, 16D

ELEVATED TEMPERATURE RESISTANT CERAMIC STRUCTURAL ADHESIVES.
Patent assigned to Air Force,
by Dwight G. Bennett, Richard M. Spriggs and Henry G. Lefort. 27 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Adhesives, Ceramic materials), (*Structural parts, Adhesives), Refractory materials, Silicon compounds, Oxides, Powder metals, Stainless steel, Sandwich construction, Honeycomb cores, Aircraft, Guided missiles, Patents.

The ceramic adhesives are made of refractory ceramic frits combined with colloidal silica, water and fine particle metal powders. They are useful in bonding metal-to-metal, especially stainless steel and in forming a honeycomb sandwich type of panel construction for use in aircraft and missiles.

Patent 3,180,827 Div. 11H, 11G

THICKENED COMPOSITIONS CONTAINING A HYDRATE OF AN ALUM.
Patent assigned to The Pure Oil Co., Chicago, Ill.
by Thomas W. Martinek and Donald L. Klass. 27 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Greases, Lubricant additives), (*Ointments, Additives), (*Lubricant additives, Aluminum compounds), (*Aluminum additives, Lubricants), Hydrates, Ammonium compounds, Alkali metal compounds, Oils, Potassium compounds, Sulfates, Selenium compounds, Tellurium compounds, Patents.

An oleaginous liquid containing a hydrate of an alum as a thickening agent is used to prepare non-bleeding greases as well as ointments, salves, jellies, etc. The product is prepared by milling small amounts of an oleaginous liquid with an alum. The alum content in the composition is between 2 and 50 percent by weight.

Patent 3,180,829 Field 11H

PENETRATING OIL.
Patent assigned to Esso Research and Engineering Co., Elizabeth, N. J.
by Finch B. Cobb, Lemuel L. Leach, Jr. and Joseph A. Snyder. 27 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Oils, Preparation), (*Aromatic compounds, Oils), Lubricant additives, Calcium compounds, Barium compounds, Phenols, Sulfonates, Sulfides, Esters, Patents.

A penetrating oil containing from 60 to 92 percent by volume of an aromatic naphtha is adapted for loosening threaded connections such as rusted bolts. The oil also contains from 4 to 21 percent by volume of a lubricating diluent oil, 1.4 to 6 percent by volume of calcium-barium nonyl phenol sulfide, 0.6 to 3 percent by volume of calcium sulfonate and 2 to 10 percent by volume of isopropyl oleate. The aromatic naphtha boils at a temperature of from 345 to 560F.

Patent 3,180,830 Field 11H

METAL WORKING LUBRICANT COMPOSITIONS.
Patent assigned to Texaco, Inc., New York,
by William R. Siegart, Norman R. Odell, and Wesley V. Taylor, Jr. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Cutting fluids, Preparation), (*Sebacic acid, Cutting oils), (*Amides, Cutting fluids), Alkali metal compounds, Sodium compounds, Alcohols, Amines, Patents.

A cutting oil composition with improved anti-rust, stability, and lubricity properties comprises water, the alkali metal salt of a substituted amide of sebacic acid, and, optionally, secondary and tertiary aliphatic alkanolamines. The oil, suitable for cutting, drilling, broaching, and drawing operations, contains from 10 to 30 weight percent of sodium or potassium N,N-bis(2-hydroxyethyl)sebacamate and from 5 to 12 percent of triethanolamine. The lubricant retains the high heat capacity of water.

Patent 3,180,831 Div. 11H

LUBRICATING COMPOSITION.
Patent assigned to Texaco, Inc., New York,
by Max J. Wisotsky and Norman R. Odell. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Complex compounds, Lubricant additives), Silicon compounds, Esters, Copper compounds, Nickel compounds, Chlorine compounds, Phenols, Organic nitrogen compounds, Oils, Antioxidants, Amines, Patents.

Silicone and diester oil base greases having a thickener of a copper or nickel chelate of substituted 2-hydroxyazobenzenes possess a high dropping point, high oxidation and corrosion resistance, and low oil separation and evaporation properties. The grease consists of from 59 to 69 percent by weight of a silicone oil of lubricating viscosity containing from 4 to 12 percent chlorine, 30 to 40 percent of a metal chelate of 5,3'-dichloro-2-hydroxyazobenzene, 0.5 percent of a sarcosine corrosion inhibitor, and 0.5 percent of an amine oxidation inhibitor. Lead naphthenate or N-acylsarcosines having 8 to 20 carbon atoms in the acyl group are suggested as anti-corrosion agents, and diphenyl-p-diphenylenediamine is the oxidation inhibitor. The silicone polymer oil may be the sole base ingredient, or minor amounts of polyethers, polyglycols, and diesters may be included.

Patent 3,181,929 Field 11F, 7A

METHOD OF INHIBITING CORROSION IN PURIFYING GASES.
Patent assigned to Interior,
by Joseph H. Field and Daniel Bienstock. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Corrosion inhibition, Steel), (*Gases, Purification), (*Vanadates, Corrosion inhibition), Corrosive liquids, Potassium compounds, Carbonates, Solutions, Carbon dioxide, Hydrogen compounds, Sulfides, Mixtures, Salts, Alkali metal compounds, Corrosion, Patents.

The process is for the removal of carbon dioxide and hydrogen sulfide from gas mixtures with aqueous potassium carbonate solutions. Corrosion of steel surfaces in the separating apparatus is inhibited by incorporating in the solution a small amount of metavanadate salt.

Patent 3,181,964 Field 11C, 13H

MAGNESIUM OXIDE COATING METHOD.
Patent assigned to Navy,
by Bruce E. Kramer and Eugene J. Fields. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Ceramic coatings, Aerospace craft), (*Refractory coatings, Magnesium compounds), (*Magnesium compounds, Oxides), (*Flame spraying, Refractory coating), Patents, Refractory materials, Powder metals, Cerium compounds, Chromium compounds, Hafnium compounds, Lanthanium compounds, Zirconium compounds, Particle size, Colloids, Oxygen, Hydrogen.

The method of coating metals is used for coating supersonic aircraft, jet engines and rocket propelled missiles. Magnesium oxide and a refractory oxide such as cerium oxide in powder form are suspended in a fluid combustible mixture containing oxygen and hydrogen. The combustible mixture is heated and a coating is sprayed onto an article to be coated.

Patent 3,182,022 Field 11H

ORGANIC ADDUCTS AND LUBRICATING COMPOSITIONS THEREOF.
Patent assigned to Texaco Inc., New York,
by William R. Siegart, Norman R. Odell and Herman D. Kluge. 4 May 65 Unclassified patent
Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Thiophosphates), (*Thiophosphates, Lubricant additives), Esters, Ethylene oxide, Complex compounds, Halohydrins, High-pressure research, Antioxidants, Patents.

Hydrolyzed alkyl alkylacrylate P2S5 reaction products are employed as extreme pressure agents and antioxidants in lubricating oils and greases. A lubricating composition containing a major proportion of lubricating oil and from 0.2 to 10 weight percent of an alkylene oxide adduct of a hydrolyzed P2S5 reaction product. The adducts can be present up to 50 weight percent in concentrates and between 0.2 and 10, preferably 1 and 5 weight percent, in finished compositions.

Patent 3,182,023 Div. 11H

LUBRICANT COMPOSITIONS.
Patent assigned to Standard Oil Co., Chicago, Ill.
by John J. Plemich and Paul C. Vienna. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Thiophosphates, Lubricants), High-pressure research, Solubility, Amines, N-heterocyclic compounds, Oils, Patents.

The solubility of thiophosphoryl derivatives as an extreme pressure ingredient for petroleum and synthetic lubricating oils is improved by incorporating from 50 to 100 percent by weight of the thiophosphoryl compound of a mixture of abietyl amines, or 1-(2-hydroxy-ethyl)-2-heptadecenyl imidazoline. The amine composition consists of 60 percent dehydroabietyl amine, 30 percent dihydroabietyl amine, and 10 percent tetra-abietyl amine. The components are added to a base oil at a temperature of 250 degrees F. The finished oil composition contains 0.5 to 10 percent of the thiophosphoryl additive.

Patent 3,182,024 Div. 11H

POLYAMINOPYRROLIDINES IN LUBRICATING OILS.
Patent assigned to California Research Corp.,
San Francisco,
by Frank A. Stuart and Robert G. Anderson. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Pyrroles), (*N-heterocyclic compounds, Lubricant additives), Cleaning compounds, Organic nitrogen compounds, Synthesis(Chemistry), Patents.

A metal-free detergent for diesel and gasoline engine lubricating oils is also effective in neutralizing acids. A 1-aminoalkyl-3-alkenylpyrrolidine compound is added to a naphthenic or paraffin base oil in amounts varying from 0.25 to 5 percent by weight. An alkenyl succinic anhydride is reacted with a polyalkylene polyamine to form pyrrolidinedione, which is reduced to the pyrrolidine. One additive composition is 1-(3-dimethylaminopropyl)-3-polyisobutenylpyrrolidine, having from 50 to 200 carbon atoms in the polyisobutenyl radical. The detergent reduces sludge and varnish without forming the ash deposits characteristic of metal-containing additives.

Patent 3,183,187 Div. 11H, 7C

PRODUCTION OF MONOCARBOXYLIC ACIDS FROM LARGE RING ALICYCLIC ALCOHOLS.
Patent assigned to Esso Research and Engineering Co.,
by Jeffrey H. Bartlett and Samuel B. Lippincott.
11 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Greases, Preparation), (*Carboxylic acids, Synthesis(Chemistry)), Monocyclic compounds, Alcohols, Oils, Alkali metal compounds, Hydroxides, Soaps, Salts, Cyclohexanols, Patents.

A grease composition is prepared from a mineral oil by reacting, in situ, cyclic secondary alcohols having from 10 to 20 carbon atoms with sodium and potassium hydroxide at temperatures from 320 to 350 degrees C. The alkali metal hydroxide-secondary alcohol fusion produces a straight chain monocarboxylic acid salt, which constitutes from 5 to 50 percent by weight of the final product. To facilitate the fusion reaction, the soap of a high molecular weight fatty acid having from 12 to 22 carbon atoms and the alkali metal salt of a low molecular weight carboxylic acid are incorporated as a suspending agent for the alkali metal compound. From 2 to 30 weight percent of hydrogenated fish oil acids are used with from 1 to 10 weight percent of acetic acid to form the salt-soap complex. The mole ratio of alkali to alcohol is 1.5 to 1. Cyclododecanol or nonylcyclohexanol are suitable alcohols.

PB-167 322 Field 11C, 1E
CFSTI Prices: HC$1.00 MF$0.50

Naval Civil Engineering Lab., Port Hueneme, Calif.
REFLECTIVITY OF AIRFIELD MARKING PAINTS,
by R. W. Drisko. 30 Jun 64, 24p
Technical rept. R-323
Proj. YR007 08 03 303
Unclassified report

Descriptors: (*Landing fields, Paints), (*Paints, Reflection), Markers, Spectra (Visible + ultraviolet), Spectra(Infrared), Pigments, Colors, Additives, Carbon black, Rutile, Titanium compounds, Dioxides, Films, Zinc compounds, Oxides, Copper compounds, Carbonates.

As part of an investigtion to determine the appropriate formulation for an airfield marking paint, a laboratory study was made of the reflectivity of such paints. Diffuse reflectance spectra and percent reflectance in the visible and near infrared (0.4 to 2.5 microns) were recorded for sixteen proprietary marking paints and a number of experimental paint formulations. Suitable combinations of pigments and infrared absorbers produced formulations with a desired high visible reflectance and low infrared reflectance. (Author)

PB-167 557 Field 11I, 13K
CFSTI Prices: HC$2.00 MF$0.50

Army Missile Command, Redstone Arsenal, Ala.
BIAXIAL STRESS-STRAIN BEHAVIOR OF NYLON TUBE SPECIMENS,
by R. E. Ely. 20 Jul 64, 46p
Rept. no. RR-TR-64-11
Projs. 1A024401A110, 1B22901A206
AD 444 775; N64 29303
Unclassified report

Descriptors: (*Pipes, Nylon), (*Nylon, Pipes), Stresses, Strain(Mechanics), Tensile properties, Compressive properties, Test methods, Hydrostatic pressure, Loading(Mechanics), Strain gages, Shear stresses, Buckling(Mechanics), Ductility, Tables, Test equipment, Mechanical properties.

Biaxial stress and strain data are given for nylon 101 tube specimens. Data are given for room temperature tests for ten stress states. These states were obtained by subjecting the tube specimens to internal fluid pressure and axial loads, both tension and compression. The effect of strain rate on properties is evaluated for uniaxial loading. The biaxial data are compared with theoretical failure criteria, and it is concluded that the mechanical behavior of nylon for small strains conforms to theories used with ductile metals. (Author)

12. Mathematical Sciences

AD-296 365 Field 12A, 15E
CFSTI Price: HC$3.00

Research Analysis Corp., McLean, Va.
THREE GENERAL NETWORK FLOW PROBLEMS AND THEIR SOLUTIONS,
by Robert G. Busacker, Stephen A. Coffin and Paul J. Gowen. Nov 62, 87p
Staff paper RAC-SP-183
Contract DA44 188AR01
Unclassified report

Descriptors: (*Networks, Algebraic topology), (*Algebraic topology, Networks), (*Logistics, Algebraic topology), Integral equations, Transportation, Costs, Graphics, Feasibility studies, Numerical methods + procedures, Optimization.

Computational procedures for solving three general network flow problems are presented, together with proofs establishing their validity. Two of the problems are concerned with the determination of feasible flows (i.e., flows that lie between prescribed bounds in every arc of the network) whose costs are minimum, where arc costs are proportional to the magnitude of arc flow. The third problem involves the determination of whether or not a given feasible flow has minimum cost. The utility of the three procedures is illustrated in the context of a general transportation application. The material presented constitutes an adaptation and unified discussion of various known concepts and results in network flow theory. (Author)

AD-409 554 Field 12B, 12A
CFSTI Prices: HC$7.00

RAND Corp., Santa Monica, Calif.
MATHEMATICAL OPTIMIZATION TECHNIQUES,
ed. by Richard Bellman. Apr 63, 356p
Rept. no. R-396-PR
Contract AF49 638 700
Unclassified report

Rept. on Proj. RAND.
Papers presented at the Symposium on Mathematical Optimization Techniques, Santa Monica, Calif.
Available copy will not permit fully legible reproduction.

Descriptors: (*Mathematics, Symposia), (*Trajectories, Rockets), (*Communication theory, Statistical processes), (*Control, Automation), Aircraft, Flight paths, Mathematical prediction, Synthesis, Probability, Dynamic programming, Nonlinear systems, Experimental data, Calculus of variations, Mathematical models, Structures, Complex variables, Real variables, Statistical functions, Metamathematics, Matrix algebra, Matched filters.

Recent developments in linear, integer, convex, and dynamic programming as well as the variational processes surrounding optimal guidance, flight trajectories, statistical decisions, structural configurations, and adaptive control systems are discussed as modern optimization techniques.

AD-418 366 Field 12B
CFSTI Price: HC$9.35

RAND Corp., Santa Monica, Calif.
LINEAR PROGRAMMING AND EXTENSIONS,
by George B. Dantzig. Aug 63, 637p
Rept. no. R-366-PR
Contract AF49 638 700
N64 13093 Unclassified report

Rept. on Proj. RAND.
Also available from Princeton University Press, $11.50.
Available copy will not permit fully legible reproduction.

Descriptors: (*Linear programming, Theory), (*Inequalities, Linear systems), Models, Mathematical models, Equations, Matrix algebra, Game theory, Combinatorial analysis, Geometric forms, Functions, Convex sets, Automation, Transportation, Tables, Bibliographies, Topology.

This book is concerned with the theory and solution of linear inequality systems. When a decision problem requires the minimization of a linear form subject to linear inequality constraints, it is called a linear program. By natural extension, its study provides further insight into the problem of minimizing a convex function whose variables must satisfy a system of convex inequality constraints. It may be used to study topological and combinatorial problems which may be couched in the form of a system of linear inequalities in discrete-valued variables. It provides a framework for extending many problems of mathematical statistics. This, in brief, is the mathematical scope of the book. To provide motivation, the first three chapters have been devoted to concepts, origins, and formulation of linear programs. To provide insight into application in a 'real' environment, two chapters on application conclude the book.

N65-21740 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
STABILITY OF MULTISTEP METHODS IN NUMERICAL INTEGRATION,
by Robert N. Lea. Apr 65, 16p Unclassified report
NASA-TN-D-2772
Descriptors: (*Integration, Numerical methods + procedures), (*Numerical methods + procedures, Integration), Stability, Differential equations.

PB-167 516 Field 12A, 12B
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
PREDECISIONS.
Econometric Research Program research memo.,
by Gunter Menges. 18 Jan 64, 23p Unclassified report
Rept. no, ERP-RM-71
Descriptors: (*Decision theory, Stochastic processes), Optimization, Mathematical logic, Decision making, Functional analysis, Operations research.

This paper departs from the question as to in which phase of the solution of a decision problem the 'tautological point' will be arrived at, after which the solution of the decision problem on hand becomes a matter of algorithm. The first step is to formalize the general decision model in a way which makes its constituent stand out as clearly as possible. The constituent of a decision problem is defined, discussed, and is shown to provide a complete characterization of the decision problem. Next the space of the constituent is introduced and the principle of accommodation is formulated, according to which the constituent and its space are to be selected in such a way that the discrepancy between the decision model and the decision problem to be solved is as small as possible. This principle is accomplished through a pre-decision rule. Ways of fixing the constituent are discussed. It is demonstrated that numerous predecisions (of a more or less arbitrary type and according to more or less objective and formalizable criteria) must be made, and ways are indicated, how they can be made. (Author)

PB-167 517 Field 12A, 12B
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
MAXIMIZATION BY QUADRATIC HILL-CLIMBING.
Econometric Research Program research memo.,
by Stephen M. Goldfeld, Richard E. Quandt, and
Hale F. Trotter. 19 Jan 65, 22p Rept. no. ERP-RM-72
Unclassified report

Descriptors: (*Iterative methods, Optimization), (*Optimization, Iterative methods), Calculus of variations, Vector analysis, Functional analysis, Mathematical programming.

The purpose of this paper is to describe a new gradient method for maximizing general functions. After a brief discussion of various known gradient methods the mathematical foundation is laid for the new algorithm which rests on maximizing a quadratic approximation to the function on a suitably chosen spherical region. The method requires no assumptions about the concavity of the function to be maximized and automatically modifies the step size in the light of the success of the quadratic approximation to the function. The paper further discusses some practical problems of implementing the algorithm and presents recent computational experience with it. (Author)

PB-167 582 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
THE ALGEBRA OF A LINEAR HYPOTHESIS,
by Henry B. Mann. Sep 58, 30p
Technical summary rept. no. MRC-TSR-40
Contract DA11 022ORD2059
AD 208 055
Unclassified report

Descriptors: (*Algebra, Linear systems), Matrix algebra, Design, Polynomials, Transformations(Mathematics).

PB-167 583 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON WEAK CONVERGENCE IN THE SPACE OF FUNCTIONS OF BOUNDED VARIATION,
by Pasquale Porcelli. Sep 58, 22p
Technical summary rept. no. MRC-TSR-39
Contract DA11 022ORD2059
AD 207 239
Unclassified report

Descriptors: (*Functional analysis, Calculus of variations), (*Calculus of variations, Functional analysis), Sequences, Groups(Mathematics).

It is shown that a sequence (f sub n), n=1 to n=infinity, of elements in a real Banach space converges weakly to zero if, and only if, lim (summation over all p>or=1 of the absolute value of f sub n(b sub p) -f sub n (a sub p)) = zero for each system (a sub p, b sub p), p=1 to p=infinity, of nonoverlapping subintervals of the Banach space.

PB-167 585 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
LINEAR SPACES AND APPROXIMATIONS THEORY,
by R. C. Buck. Oct 58, 15p
Technical summary rept. no. MRC-TSR-48
Contract DA11 022ORD2059
AD 208 051
Unclassified report

Descriptors: (*Functional analysis, Numerical analysis), (*Numerical analysis, Theory), Polynomials, Linear programming.

PB-167 598 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SURVEY OF RECENT RUSSIAN LITERATURE ON APPROXIMATION,
by R. Creighton Buck. Oct 58, 19p
Technical summary rept. no. MRC-TSR-51
Contract DA11 022ORD2059
AD 207 999
Unclassified report

Descriptors: (*Bibliographies, Functional analysis), (*Functional analysis, Bibliographies), USSR, Polynomials, Numerical analysis.

PB-167 599 Field 12B
CFSTI Prices: HC$2.00 MF$0.50

Research Analysis Corp., McLean, Va.
THE SEQUENTIAL UNCONSTRAINED MINIMIZATION TECHNIQUE FOR NONLINEAR PROGRAMMING. ALGORITHM II. OPTIMUM GRADIENTS BY FIBONACCI SEARCH,
by Anthony V. Fiacco and Garth P. McCormick.
Jun 64, 29p Technical paper RAC-TP-123
Contract DA44 188AR01
AD 450 546
Unclassified report

Descriptors: (*Nonlinear programming, Optimization), Sequential analysis, Iterative methods, Theorems, Functions.

PB-167 602 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A CLASS AUGMENTED DESIGNS,
by Robert G. D. Steel. Oct 58, 17p
Technical summary rept. no. MRC-TSR-56
Contract DA11 022ORD2059
AD 207 998
Unclassified report

Descriptors: (*Combinatorial analysis, Analysis of variance), Theory.

A class of augmented designs related to the Latin square, but different from the augmented Latin square design, is described. The analysis is given. The design is compared with alternatives and the power is considered. A special application concerning homogeneity of variance in Latin squares is included. (Author)

PB-167 603 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

LIMIT THEOREMS FOR SEMI-MARKOV PROCESSES, PART I,
by P. M. Anselone. Jan 59, 9p
Technical summary rept. no. MRC-TSR-59
Contract DA11 022ORD2059
AD 212 055
Unclassified report

Descriptors: (*Stochastic processes, Theorems), Measure theory, Sequences, Statistical processes.

PB-167 604 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
NOTE ON A THEOREM BY HANS SCHNEIDER,
by A. M. Ostrowski. Mar 61, 15p
Technical summary rept. no. MRC-TSR-219
Contract DA11 022ORD2059 Unclassified report

Descriptors: (*Matrix algebra, Inequalities), (*Inequalities, Matrix algebra), Theorems, S-matrix, Combinatorial analysis, Determinants.

PB-167 606 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
THE INVERSION OF MATRICES: A SUMMARY,
by Alston S. Householder. 1 May 57, 25p
Technical summary rept. no. MRC-TSR-3
Contract DA11 022ORD2059
AD 147 632 Unclassified report

Descriptors: (*Matrix algebra, Transformations-(Mathematics)), (*Transformations(Mathematics), Matrix algebra), Algebra, Equations, Operators-(Mathematics).

Relations are pointed out among a number of methods of inverting matrices.

PB-167 609 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE STRONG LAW OF LARGE NUMBERS IN BANACH SPACES,
by Anatole Beck. Apr 59, 27p
Technical summary rept. no. MRC-TSR-90
Contract DA11 022ORD2059 Unclassified report
AD 218 615

Descriptors: (*Functional analysis, Number theory), (*Number theory, Functional analysis), Real variables, Stochastic processes.

13. Mechanical, Industrial, Civil, and Marine Engineering

N65-18208 Field 13I, 20K
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.

EFFECT OF COMPONENT DIFFERENTIAL HARDNESSES ON ROLLING-CONTACT FATIGUE AND LOAD CAPACITY,
by Erwin V. Zaretsky, Richard J. Parker, and William J. Anderson. Mar 65, 21p NASA-TN-D-2640
Unclassified report

Descriptors: (*Fatigue(Mechanics), Roller bearings), (*Roller bearings, Fatigue(Mechanics)), Hardness.

Patent 3,176,646 Field 13J

TOW CABLE WITH MINIMUM WIDTH FAIRINGS.
Patent assigned to Navy,
by Julius O. Natwick and Donald A. Nichols. 6 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Towing cables, Cable fairing), Patents, Underwater equipment, Design, Drag, Electric cables.

The tow cable is for towing sonar devices through the water from a ship. The streamlined fairing units are pivoted on the tow cable or wire rope by having aligned passages in the units through and along which the tow cable passes successively, and the electrical conductors, through which the ship maintains communication with the towed body, are in flat ribbon form disposed in the same passages of the fairing units through which the tow cable passes, and extending alongside the tow cable.

Patent 3, 177, 017 Field 13E

BALL AND SOCKET PIPE JOINT.
Patent assigned to Commerce,
by Leslie A. Guildner and Harold F. Stimson. 6 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Joints, Pipes), (*Flexible coupling, Pipes), Seals(Stoppers), Patents, Design, Bearing, Springs.

The joint or pipe connector is used to transfer fluids under a wide range of pressures and temperatures. The conduit for connection with the ball is not terminated in the end of the socket casing as in the prior art, but rather extends into the casing to terminate adjacent the ball therein. A bearing is disposed between the confronting portions of the conduit and ball, and a packing sleeve is fitted into the casing around the conduit, bearing and ball so as to seal the ball to the conduit. The end of the ball opposite the conduit is provided with another bearing which is arranged with the conduit to be urged by springs connected to the ends of the casing so as to firmly engage the ball in the bearings.

Patent 3,179,368 Field 13L, 13J

SHOCK ISOLATION SUPPORT.
Patent assigned to Navy,
by Frank I. Whitten and Arthur E. Hirsch.
20 Apr 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Seats, Vibration isolators), (*Vibration isolators, Marine safety equipment), (*Shock resistance, Impact shock), Naval personnel, Cylindrical bodies, Supports, Mines(Ordnance), Torpedo attack, Patents, Shipborne.

The shock isolating supports protect seated personnel and equipment from violent shock forces such as those received by a ship when it is mined or torpedoed. A unique arrangement is provided of telescoping cylinders, an energy transferring medium disposed between the cylinders, and one or more self-rearming shearing pin mechanisms to provide a rigid, positive connection between the deck and the seated object.

Patent 3,179,582 Field 13J, 11F

WELDING ATTACHMENT OF ANODES FOR CATHODIC PROTECTION.
Patent assigned to Navy,
by Herman S. Preiser. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Ship hulls, Cathodic protection), (*Cathodic protection, Ship hulls), (*Aluminum, Cathodic protection), Anodes(Electrolytic cell), Electrochemistry, Welding, Aluminum alloys, Iron, Zinc, Copper, Titanium, Manganese, Silicon, Beryllium, Patents.

The aluminum hull of a seagoing vessel is cathodically protected against electrolytic corrosion. Sacrificial anodes are attached to the aluminum body by use of an aluminum welding material which is more cathodic than the anode. The weld bead consists of 4.5 to 6 percent iron, small amounts of zinc, copper, titanium, manganese, silicon and beryllium, and the remainder aluminum.

Patent 3,179,731 Field 13A, 13H, 13M

SUPPORT MEANS FOR RESISTANCE FURNACE.
Patent assigned to Air Force,
by Burns A. Cash and Richard C. Anderson. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Furnaces, Resistance(Electrical)), (*Supports, Furnaces), (*Glass, Melting), Patents, Electrical resistance, Bearings.

The furnace is for melting glass. The structure includes horizontally-spaced electroconductive supports having aligned trunnion bearings. The supports permit inversion of the furnace and dumping of a glass melt from the furnace receptacle.

Patent 3,179,962 Field 13J

FLOTATION APPARATUS AND MECHANICAL CONTROL THEREFOR.
Patent assigned to Navy,
by John C. Shear and Lester N. Poust.
27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Floats, Control systems), Flotation, Floating bodies, Inflatable structures, Containers, Pistons, Cylindrical bodies, Patents.

The flotation apparatus is for suspending a device in a body of water at a preset or controlled depth range. The apparatus includes a housing open to the water and containing a bellows, an inflatable container, a gas source, a piston and cylinder open to the water and connecting tubes and valves.

Patent 3,180,021 Field 13H

WELD JOINT BACKING AND METHOD OF WELDING WITH SAME.
Patent assigned to Army,
by James N. Cordea, Robert M. Evans and Perry J. Rieppel. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Welding, Patents), Joints, Armor plate, Steel, Metals, Coatings.

The method is for joining two elongated metallic members such as armor plate. A loose particle backing material compensates for poor fit up and misalignment of the plates to be welded. An elongated holding strip is secured to the underside of the plates. This strip holds the loose particle backing material. The backing material is formed from steel shot with a coating having a m.p. higher than the shot.

Patent 3,180,670 Field 13I

CHASSIS PULLING TOOL.
Patent assigned to Navy,
by Thomas R. Pryde. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Small tools, Electronic equipment), Separation, Modules(Electronics), Force(Mechanics), Patents.

The tool permits the operator of electronic units to withdraw a chassis from a rack with controlled force. The electronic equipment including printed circuitry is contained in a number of drawer-like chassis or trays. Each chassis carries a plug which is inserted in a receptacle on the rack to make an electrical connection. The plug is disconnected from the receptacle by use of a device which is positioned at the front of each drawer and exerts a mechanical force to open the drawer.

Patent 3,180,756 Field 13H, 11B, 11F

COPPER METALLIZING OF ALUMINA CERAMICS.
Patent assigned to AEC,
by Robert E. Cowan. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Ceramic materials, Copper coatings), (*Copper coatings, Ceramic materials), Aluminum compounds, Oxides, Printed circuits, Electrical conductance, Oxidation, Reduction(Chemistry), Patents.

The process is for producing a copper coating on an alumina ceramic body that is a good conductor of electricity. The process can be used for making a printed circuit. A thin layer of Cu2 and A1203 is applied to an alumina ceramic. The resulting article is then fired in an oxidizing atmosphere at 1190 degrees C. and then in a reducing atmosphere at 1000 degrees C. to form the adherent layer.

Patent 3,181,844 Field 13A

PORTABLE HUMIDIFIER.
Patent assigned to Air Force,
by Thomas C. Glaze. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Air conditioning equipment, Humidity), (*Humidity, Air conditioning equipment), Steam, Portable, Test facilities, Heating, Patents.

The portable humidifier is capable of supplying air to a test chamber at from 50 to 180 degrees F. at a relative humidity of up to 95 percent. Elements are provided to heat the air entering the inlet and to heat the humidity pad. Steam is mixed with the water supplied to the humidity pad.

Patent 3,181,893 Field 13F

UNIVERSAL TOW BAR.
Patent assigned to Navy,
by Howard B. Jopson, Harold V. Yentzer, and Paul Karnow. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Tow bars, Aircraft), Patents, Disconnect fittings, Couplings, Locking fastener devices.

The tow bar is employed aboard aircraft carriers for towing various types of aircraft to and from a storage area. The tow bar structure is such that it may be used with aircraft having dissimilar connections. The device has no dangerous projecting elements on it.

PB-167 552 Field 13B
CFSTI Prices: HC$6.00 MF$1.50

Robert A. Taft Sanitary Engineering Center,
Cincinnati, Ohio.
SYMPOSIUM: AIR OVER CITIES.
1961. 295p
Technical rept. no. SEC-TR-A62-5
Unclassified report

Symposium held November 6-7, 1961, Cincinnati, Ohio.

Descriptors: (*Air pollution, Urban areas), (*Sanitary engineering, Air pollution), Symposia, Climatology, Meteorological parameters, Atmospheric temperature, Atmospheric precipitation, Clouds, Wind, Humidity, Air, Contamination, Visibility, Smokes, Waste gases, Toxicity, Air transportation, Mathematical models, Public Health.

Contents: Air pollution studies in the Netherlands; Recent developments in the chemistry of urban atmospheres; Climatological evaluation of precipitation patterns over an urban area; Effects of air pollution on visibility in and near cities; Smoke concentrations in Montreal related to local meteorological factors; Air over Philadelphia; Thermal climate of cities; Observations of cloud initiation in industrial areas; Analog computing techniques applied to atmospheric diffusion: continuous area source; Dispersion calculations for multiple sources; Effects of city structure on the transport of airborne material in urban areas; Source configurations and atmospheric dispersion in mathematical models of urban pollution distributions; Aspects of atmospheric diffusion in urban areas; Relative importance of some meteorological factors in urban air pollution; Measurement programs required for evaluation of man-made and natural contaminants in urban areas; Representativeness of local observations in air pollution surveys; Present and future needs for meteorological and air quality observations in Canada; Problems associated with forecasting air pollution over an urban area; Need for more meaningful meteorological and air quality observations for mortality and morbidity studies.

PB-167 574 Field 13J, 17B
CFSTI Prices: HC$1.00 MF$0.50

Bureau of Ships, Washington, D. C.
INTERIOR COMMUNICATION SYSTEMS. LIST OF IMPORTANCE, READINESS, AND DESIGNATION CLASSIFICATION.
Design data sheet.
1 Mar 65, 16p DDS-9650-1
Unclassified report

Descriptors: (*Ships, Construction), (*Communication systems, Design), Circuits, Specifications, Effectiveness.

The design data sheet is a comprehensive list of interior communication systems used in new construction and conversion ship designs. Systems are classified by importance, readiness, and designation.

14. Methods and Equipment

AD-434 382 Field 14E, 20F
CFSTI Price: HC$1.00

IIT Research Inst., Chicago, Ill.
STUDY OF FACSIMILE SCANNING AND RECORDING TECHNIQUES EMPLOYING FIBER OPTICS.
Quarterly rept. no. 7, 15 Jul-15 Oct 63,
by D. A. Pontarelli. 25 Mar 64, 8p
Rept. no. IITRI-A1203-22
Contract DA36 039SC88927, Proj. A203,
Task 3A99 22 001 02 04 Unclassified report
See also AD-426 818.

Descriptors: (*Fiber optics, Facsimile recording systems), (*Facsimile equipment, Fiber optics), (*Optical scanning, Fiber optics), Analysis, Photometers, Photographic film, Illumination.

Investigations were made of the two types of imperfections present in reproductions made with the fiber optics modified facsimile system: fine dark lines and gradual variations in density across the copy.

Patent 3,176,800 Div. 14B

DAMPING MEANS.
Patent assigned to Army,
by Ronald D. Trupp. 6 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Gyroscopes, Damping), (*Accelerometers, Damping), (*Damping, Instrumentation), Fluid flow, Laminar flow, Patents, Motion, Temperature sensitive elements, Viscosity.

The damping mechanism is used in gyroscopes and accelerometers to maintain required precision under dynamic conditions. The motion of a mechanism to be damped drives a pump for forcing the damping liquid through a conical valve port having a flow path length large compared to its radial opening so as to assure a uniform laminar flow. A temperature sensitive mechanism controls either the radial spacing, the flow path length or both to compensate for changes in fluid viscosity.

Patent 3,179,350 Field 14E

REEL LOCK.
Patent assigned to Air Force,
by Guy A. Morse, Jr.
20 Apr 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Photographic equipment, Reels), (*Reels, Locking fastener devices), Photographic film, Patents.

The lock is for film or ribbon reels. It positions and locks a reel or spool to a shaft to be driven thereby. The device has a slide mounted upon the side of the reel. The slide has an aperture which can be aligned with the aperture of the reel so that the shaft can pass through both the reel and the slide when these apertures are aligned. Along the shaft, grooves are provided to receive the slide to axially position the reel. A portion of the slide and a portion of the groove are adapted for mutual engagement to rotationally lock the reel to the shaft.

Patent 3,179,533 Field 14C, 9B, 11D

MAGNETIC TAPE WITH REINFORCED BACKING.
Patent assigned to Army,
by Adolphe Rusch. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Magnetic tape, Reinforcing materials), (*Reinforcing materials, Magnetic tape), Glass textiles, Rayon, Filaments, Polyester plastics, Plastics, Carbonates, Solvents, Iron compounds, Oxides, Filaments, Impregnation, Bonding, Powders, Data storage systems, Patents.

The magnetic tape is composed of a backing material of continuous multi-filament glass yarns and/or saponified acetate yarns are impregnated and bonded with polycarbonate resin. The impregnated backing material bears on one of its surfaces a coating from a dispersion of magnetic ferric oxide powder in polycarbonate solvent containing some polycarbonate resin.

PB-167 330 Field 14B
CFSTI Prices: HC$1.25 MF$0.75

Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS. Unclassified report
May 65, 55p
Also available on subscription from CFSTI,
$10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research laboratories, Reports), (*Scientific research, Navy), Naval research, Chemistry, Polymers, Combustion, Hydrocarbons, Glass, Mechanics, Glass textiles, Metallurgy, Ceramics, Fracture(Mechanics), Aluminum, Titanium, Nuclear physics, Radio, Patents.

15. Military Sciences

PB-167 553 Field 15G
CFSTI Prices: HC$5.00 MF$1.00

Arctic Aeromedical Lab., Fort Wainwright, Alaska.
SYMPOSIUM: REVIEW OF RESEARCH ON MILITARY PROBLEMS IN COLD REGIONS,
by Charles R. Kolb and Fritz M. Holmstrom. Dec 64, 169p
Rept. no. AAL TDR-64-28
AD 457 733
Unclassified report

Presented at Alaskan Science Conference (15th) American Association for the Advancement of Science, College, Alaska 31 August-4 September 1964.

Descriptors: (*Armed forces operations, Cold weather tests), Alaska, Arctic regions, Symposia, Meteorological parameters, Glaciers, Polar regions, Army operations, Materials, Brittleness, Fracture(Mechanics), Elastomers, Rubber, Tensile properties, Metallurgy, Steel, Pavements, Asphalt, Cements, Snow, Trafficability, Vehicles, Water, Radio communication systems, Protective clothing.

Contents: A philosophy for military research and development in Alaska and other Arctic regions, Notes on the physical environment of Alaska, Major Army operational problems in cold regions, Materials engineering for cold regions and the brittle fracture, Military construction problems in Alaska, Arctic and Subarctic sanitation in military field operations, Trafficability of snow and muskeg, A summary of water supply problems in Alaska, Long distance radio communications in the Polar regions, A summary of Army environmental research in Alaska, The life sciences research approach to improved military effectiveness in the Arctic, The Arctic soldier: Possible research solutions for his protection, Enhancing the effectiveness of the individual in the Arctic through clothing and equipment, Effect of air movement on atmospheric cooling power, The effect of Arctic isolation on human performance.

PB-167 601 Field 15E, 9B
CFSTI Prices: HC$3.00 MF$0.75

Research Analysis Corp., McLean, Va.
COMPUTER SIMULATION AND GAMING IN LOGISTICS RESEARCH,
by Strother H. Walker. Oct 62, 58p
Staff paper RAC-SP-187
Contract DA44 188AR01
AD 295 735
Unclassified report

Descriptors: (*Logistics, Game theory), (*Mathematical models, Logistics), Operations research, Reviews, Management planning, Military requirements, Scientific research, Computers, Simulation.

16. Missile Technology

Patent 3,180,222 Field 16A

SIMPLIFIED SYSTEM TO CONTROL POST-LAUNCH FLOODING.
Patent assigned to Navy,
by Tsoy K. Moy. 27 Apr 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Launching, Guided missiles(Underwater-to-surface)), (*Guided missile launchers, Stability), Water, Control systems, Weight, Submarines, Underwater equipment, Supports, Patents.

The launching system for missiles is used on submarines or submerged platforms. The system anticipates initially a launching capability of two types of missiles of different weights. Since the change of weight of the vessel after missile ejection, without flooding control, would vary depending upon whether a normal weight or light missile was launched, the operation of weight compensation in the vessel is complicated. A cavity is created for trapping air within the launch tube thus reducing the amount of flooded water in the tube when a light weight missile has been ejected. By this arrangement, the weight of the flooded water is controlled and limited to approximately that of the ejected missile.

Patent 3,180,225 Field 16A

SUSPENDED WATER-LAUNCHED MISSILE.
Patent assigned to Navy, Unclassified patent
by John Emery Draim. 27 Apr 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Guided missiles(Underwater-to-surface), Launching), (*Launching, Guided missiles(Underwater-to-surface)), Rockets, Stability, Balloons, Damping, Motion, Patents.

The rocket powered missile is suspended in a vertical position under the water from a balloon floating on the water. The balloon is released from the missile at the time of firing. Vertical motion of the missile is damped by attaching a plate dampener to the exhaust end of the missile. The dampener is released just prior to firing of the missile.

Patent 3,181,422 Field 16A

DEVICE FOR HANDLING A WATER-LAUNCHABLE MISSILE.
Patent assigned to Navy, Unclassified patent
by John E. Draim. 4 May 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Guided missiles, Ballast tanks), (*Ballast tanks, Guided missiles), Handling, Stabilization systems, Patents.

The floatable missile has a ballasting tank at the aft end. The tank has provision for selectivity orienting the missile either in a position for towing purposes or a position for launching purposes and further provides for stabilizing the missile in roll when it is in towing position. A device releases the tank from the missile at the time of launching.

17. Navigation, Communications, Detection, and Countermeasures

NCH-100 019 Field 17B, 3B

National Bureau of Standards, Washington, D. C.

A STUDY OF LUNAR SURFACE RADIO COMMUNICATION,
by L. E. Vogler. 14 Sep 64, 127p
Monograph no. M-85
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.70, as C-13.44:85.

Descriptors: (*Moon, Radio communication systems), (*Radio communication systems, Moon), Radio transmission, Radiofrequency power, Attenuation, Extraterrestrial topography, Noise(Radio), Antennas, Ionospheric propagation.

The problem of point-to-point radio communication on the moon is discussed, and equations and curves are presented to estimate power requirements in lunar communication systems. Assuming a smooth surface, consideration is given to ground wave attenuation over both layered and non-layered grounds, antenna ground losses in situations where ground screens are impractical, noise level estimates in the receiving system, and the effects on propagation of possible lunar ionospheres. An example of the calculation of required power for a particular communication system is given, and further studies are suggested. (Author)

Patent 3,177,485 Field 17I

AUTOMATIC RADAR TARGET TRACKING SYSTEM.
Patent assigned to Air Force, Unclassified patent
by John W. Taylor, Jr. 6 Apr 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Radar targets, Radar tracking), (*Radar tracking, Radar equipment), Radar echo areas, Voltage, Patents.

The system utilizes the Cartesian coordinates of the target display to provide biased voltages to maintain the radar system responsive to target echoes from a particular geographic location in which the tracked target is located. The velocity of the target provides correction voltages for the position voltage of a memory system.

Patent 3,178,714 Div. 17B, 17G

THREE DIMENSIONAL DATA DISPLAY SYSTEM.
Patent assigned to Army, Unclassified patent
by Robert Felts. 13 Apr 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Stereoscopic display systems, Position finding), Patents, Data storage systems, Reproduction, Tracking, Optical tracking, Gels.

The display system gives a visual representation of a body in space. It can be used to represent movement of a body in an ocean or over land or to represent variables in mathematical equations. The three dimensional data display system shows the movement of a vehicle in space by visual reproduction of the movement in a transparent tank of transparent gel by use of an ink trace. The data may be stored and reproduced.

Patent 3,180,295 Field 17D

SUBMARINE SIMULATOR.
Patent assigned to Navy,
by Otto Christopher Niederer. 27 Apr 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Submarines, Simulators), Underwater sound, Noise, Motion, Patents.

The simulator is used in a liquid medium such as the ocean to simulate motions, size and noise of an underwater craft. A propulsion motor drives the propeller. The simulator can be controlled by radio, is recoverable and can simulate any maneuver of a submarine.

Patent 3,180,296 Div. 17G, 19H

CONTINUOUS WAVE ACOUSTIC GUIDANCE SYSTEM.
Patent assigned to Navy,
by William H. Hamilton and Arthur Nelkin. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Guidance, Torpedoes), (*Torpedoes, Guidance), Acoustic equipment, Patents.

The guidance system is for torpedoes to guide it to a target. The system is for torpedoes having a steering system. Circuitry is provided for transmitting continuous wave acoustic energy, for forming the energy reflected from the target into an A.C. signal having a modulation envelope determined by the bearing and elevation of the target, for demodulating the signal and for controlling the steering.

Patent 3,181,115 Field 17B, 13J

UNDERWATER TELEPHONY.
Patent assigned to Navy,
by Walter N. Wainwright. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Underwater telephones, Scuba divers), Telephone communication systems, Oscillators, Modulators, Band-pass filters, Power amplifiers, Patents.

The underwater telephone is particularly useful for underwater swimmers. A homing, constant frequency signal may be used to guide or determine the location of the swimmers. Each swimmer carries the portable equipment which transmits solely through the water. The system includes an oscillator, a balanced modulator, a band-pass filter, a power amplifier and other components.

Patent 3,181,139 Field 17I, 14C

RADAR INFORMATION RECORDING SYSTEM.
Patent assigned to Navy,
by Warren E. Milroy. 27 Apr 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Radar equipment, Recording systems), Broadband, Radar tracking, Radar antennas, Computers, Synchros, Digital systems, Patents.

The system is for recording wide band radar video, trigger and antenna azimuth on magnetic tape. The information may be used for post collision and crash fact finding work. The system may be used in conjunction with a computer and for tracking. A synchro to digital conversion unit is used.

Patent 3,181,152 Field 17G, 1C

MULTI-MODE NAVIGATION APPARATUS.
Patent assigned to Navy,
by Francis E. J. Tholey. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Navigational aids, Helicopters), (*Helicopters, Navigational aids), Tracking, Plan position indicators, Plotting boards, Doppler radar, Patents.

The multi-mode navigation tracking and display system is for use on helicopters. An integrated Doppler radar and dead reckoning tracking and display apparatus is provided in which the two are harmonized for compatible operation of a single plan position indicator or PPI.

Patent 3,181,813 Div. 17G, 16D

INTER-FEROMETER HOMING SYSTEM.
Patent assigned to Navy,
by Joseph F. Gulick, Jr., Thomas D. Jacot,
Harlan H. Knapp, Jr., and Hilary H. Nall. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Homing devices, Guided missiles), (*Interferometers, Homing devices), Gyroscopes, Patents.

The interferometer homing system is for steering guided missiles toward a collision with a target. Two separated horn-type antennas are mounted upon the guided missile. The interferometer homing system produces a steering signal in which there appears no false information in the form of biases. The gyroscope compensation factor remains fixed throughout the flight of the missile.

Patent 3,182,283 Div. 17A, 13J

METHOD OF MEASURING THE VELOCITY OF AN UNDERWATER MOVING SOUND SOURCE.
Patent assigned to Navy,
by Herman E. Ellingson and John C. Munson. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Underwater sound, Velocity), (*Submarines, Velocity), Measurement, Patents.

The velocity of a moving submarine is measured. The speed is measured by sensing the sound source at two widely spaced receiving stations between which the source is moving, measuring the difference in time interval within which corresponding elements of the signal are received at the two stations as a result of the Doppler effect, and employing the information thus obtained to determine the velocity of the moving sound source.

PB-167 504 Field 17G
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
NAUTICAL CHARTING, A COOPERATIVE EFFORT,
by H. Arnold Karo. 1963, 12p Unclassified report

Paper presented at the 1963 Annual Meeting, United States Power Squadrons, Miami Beach, Fla., 17-20 Jan 63.

Descriptors: (*Surveying, Oceans), (*Oceanographic data, Maps).

The progress made in nautical surveying, both nationally and internationally, is discussed.

PB-167 509 Field 17J, 8K
CFSTI Prices: HC$2.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
ELEMENTS OF SEISMOLOGY,
by Dean S. Carder. Dec 50, 42p
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Seismology, Textbooks), Seismographs, Seismic waves, Earthquakes, Microseisms, Propagation, Reflection, Refraction, Meteorological phenomena.

A study course is outlined to introduce students to the fundamentals of the science of Seismology and to furnish him with a factual background which, together with experience in working with the instruments and reading of the records, will assist him to operate a seismograph station and interpret the records.

PB-167 547 Field 17G
CFSTI Prices: HC$1.00 MF$0.50

Federal Aviation Agency, Indianapolis, Ind., Technical Development Center.
AN ANALYSIS OF LETTERING STYLES FOR AN IMPROVED RASTER-TYPE DATA DISPLAY,
by Leonard C. Moore and Paul M. Nida. Dec 58, 18p Technical development rept. no. 378
Unclassified report

Descriptors: (*Air traffic control systems, Display systems), (*Display systems, Design), Effectiveness, Illumination, Colors, Signals, Radar tracking, Radar targets, Visual perception, Specifications, Background, Visibility, Analysis.

The report contains an analysis of a study and evaluation conducted for the purpose of developing an inproved data presentation to be used with raster-type pictorial air traffic control displays. A satisfactory data presentation is a highly desirable function of radar target-tracking markers. It was necessary to design a new style of alpha-numeric characters to satisfy the present requirements for a SPANRAD data display; thus, the development of alpha-numeric symbols suitable for use with SPANRAD is described in considerable detail. This new design incorporates available information on legibility and the specific requirements of the air traffic control environment. (Author)

18. Nuclear Science and Technology

AD-285 564 Field 18H, 7E
CFSTI Price: HC$3.00

Johnston (William H.) Labs., Inc., Baltimore, Md.

BASIC STUDIES IN RADIATION EFFECTS ON MATERIALS. PART II. IONIC FRAGMENTATION OF MOLECULES BY X-RAYS AND SECONDARY ELECTRON SPECTRA FROM BOMBARDMENT OF GAS WITH ELECTRONS.
Final rept. for 14 Oct 60-14 Dec 61,
by M. Vestal, M. Krause, A. L. Wahrhaftig, F. W. Lampe, and W. H. Johnston. Jul 62, 80p
Contract AF33 616 7678, Proj. 7360, Task 736003
ASD TDR-62-10 P2
Unclassified report

Descriptors: (*Radiation chemistry, Materials), (*Materials, Radiation damage), (*Nitrogen compounds, Oxides), Propanes, Mass spectroscopy, Electrons, Energy, Electron bombardment, Measurement, Secondary emission, Theory, Chemical reactions, Radioactivity, Mass spectrometers, Ions, Gases, Molecules, X-rays.

The effects of radiation on any given material depends on the physics of the primary interaction with the material and the complex chemistry initiated. In the present studies, the combination of a coincidence mass spectrometer (patented) and a special x-ray tube, which was described in Part I, has made possible direct measurements of the ion fragmentation patterns produced by x-ray impact on simple gas phase molecules. Mass spectra are reported for nitrous oxide, and for propane under bombardment by low energy x-rays. For comparison purposes, spectra were also obtained of these materials under bombardment by 1200 ev primary electrons. The present studies also concern measurements of the secondary electron energy distributions for a number of molecules of importance in radiation chemistry, at a fixengle, using primary ionizing electrons in the energy range of 100 to 1000 ev. Measurement of the electron energy spectrum is accomplished in the coincidence mass spectrometer. Theoretical interpretation of the data in terms of radiation chemical effects is included. The design, construction, and operation of the instrumentation, which has made these measurements possible, are described. (Author)

AD-430 132 Field 18H, 9A
CFSTI Price: HC$5.00

Hughes Aircraft Co., Fullerton, Calif. Ground Systems Group.
DETERMINATION OF TRANSISTOR FIGURE-OF-MERIT FOR RADIATION EFFECTS.
Final rept. for 1 Jun 62-7 Sep 63,
by C. W. Perkins and G. D. Thomas. 7 Sep 63, 174p
Rept. no. R-4
Contract DA36 039sc90703, Proj. 74 000 05 28
Unclassified report

Descriptors: (*Transistors, Radiation damage), (*Radiation damage, Transistors), Degradation, Electronic equipment, Electrical properties, Measurement, Gain, Electric currents, Voltage, Silicon, Germanium, Germanium alloys, Neutron flux.

Transient radiation effects on current gain (h sub FE) collector leakage current (I sub CBO) and saturation voltage (V sub SAT) were studied with both linear accelerator and pulsed reactor irradiations. The latter was also used for permanent damage studies. Transient radiation effects are found to relate to effects on (I sub CBO). Germanium mesa types show the least permanent degradation to (h sub FE) and (V sub SAT), but the silicon planar types show no (I sub CBO) degration. The silicon planar types are the least susceptible to transient effects.n, F) (h sub FE) is shown not to degrade transientwise as long as the operating point is maintained constant. Figures-of-merit are defined. (Author)

N65-21644 Field 18J, 20H
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EFFECTS OF SHIELDING ON THE COULOMB T MATRIX,
by William F. Ford. Apr 65, 28p
NASA-TN-D-2781
Unclassified report

Descriptors: (*Shielding, Charged particles), Quantum mechanics, Special functions(Mathematical).

Patent 3,179,722 Field 18J

METHOD OF PREPARING SPHERICAL NUCLEAR FUEL PARTICLES.
Patent assigned to AEC,
by Howard E. Shoemaker. 20 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel processing, Spheres), (*Carbides, Reactor fuels), Particles, Thorium compounds, Plutonium compounds, Uranium compounds, Reactor fuel elements, Reactor materials, Graphite, Carbon, Patents.

The nuclear fuel carbides are used in fuel elements of nuclear reactors. Dense particles of carbides of thorium, plutonium and uranium are produced. The mixture is particulated, dispersed in particulate graphite and heated until the particles have melted and spheroidized. The particles are then cooled to solidify them.

Patent 3,181,653 Field 18I, 14B

CRASH ENERGY ABSORBER FOR HEAVY APPARATUS.
Patent assigned to AEC,
by Jack A. Roskelley. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Safety devices, Sychrocyclotrons), (*Synchrocyclotrons, Safety devices), Damage, Ion beams, Spikes, Iron, Sheets, Absorption, Patents, Test equipment.

The crash energy absorber or safety device is for the protection of a synchrocyclotron from damage due to structural failure in a plunging magnet system used for ion beam extraction. The device includes one or more long pointed parallel spikes mounted on the element to be stopped and projecting therefrom in the direction of the undesired travel. A stationary, securely anchored pad is disposed adjacent the forward end of the spikes in position to be penetrated thereby in event of movement of the element. To provide for a gradual non-resilient absorption of the kinetic energy of the moving element, the pad is comprised of a series of parallel spaced apart plates of a strong ductile material such as sheet iron, the plates being disposed traversely in the path of the spikes.

Patent 3,181,700 Field 18J

IMMISCIBLE LIQUIDS SEPARATOR.
Patent assigned to AEC,
by James C. Hesson. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel processing, Separation), Breeder reactors, Reactor materials, Metals, Ceramic materials, Patents, Reactor control, Liquids.

The separator is designed for use in the reprocessing of spent fuels from breeder nuclear reactors and in the pyrometallurgic processing and reprocessing of radioactive materials. The apparatus is designed particularly for the separation of molten metals and molten ceramics and is operated in a heavily shielded enclosure by remote control without any provision for determining the position of the interface between the liquids. Gas pressure is utilized in the separation process.

Patent 3,182,102 Field 18J, 11B

METHOD AND APPARATUS FOR MAKING DENSE BODIES OF REFRACTORY MATERIALS.
Patent assigned to AEC,
by Massoud T. Simnad. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Material forming, Graphite), (*Refractory materials, Reactor fuel elements), (*Reactor fuel elements, Graphite), Density, Patents, Manufacturing methods, Dies, Pressure, Hot working, Powders, Binders, Bonding.

Apparatus and methods are provided for the production of nuclear fuel element components by forming dense bodies of graphite. The entire forming operation is reduced to a period of less than one hour, frequently about 10 minutes.

19. Ordnance

AD-433 000 Field 19D, 20C, 20I, 20N
CFSTI Price: HC$2.00

Stanford Research Inst., Menlo Park, Calif.
THE MAGNETIC AND IONIC STRUCTURE OF AN ELECTROMAGNETICALLY PRODUCED SHOCK,
by H. Guthart and T. Morita. Jan 64, 46p
Technical rept. no. TR-16
Contract SD103, Projs. 7400, 3857
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Shock waves, Electromagnetic waves), (*Electromagnetic waves, Shock waves), (*Shock tubes, Electromagnetic waves), Magnetic properties, Ions, Gases, Magnetic recording systems, Reynolds number, Ionization gages, Image intensifiers(Electronics), Piezoelectric transducers, Electromagnetism, Plasma physics.

The structure of the gas behind a strong shock generated by an electromagnetic shock tube has been investigated using magnetic pickup loops, an asymmetrical

ion probe, an image converter camera, and a piezoelectric pressure probe. The shock tube consists of a 15-cm-ID Pyrex tube of adjustable length connected to a conical discharge section. Four capacitors were charged to 12 kv and fired into the tube. The azimuthal magnetic field generated by the electrical discharge is 'frozen' into the gas behind the shock because of the high magnetic Reynold's number. Its transverse distribution is shown to be consistent with a toroidal current hypothesis and a multipole axial distribution corresponding to the damped sinusoidal wave shape of the current in the external circuit. The peak magnetic field strength measured 5000 gauss at 10 cm from the discharge section and 20 gauss at a 40 cm. A precursor ion density three orders of magnitude below the shock maximum is also observed 6 cm in front of the shock at a position 70 cm from the discharge section. (Author)

AD-450 567 Field 19A, 20N
CFSTI Price: HC$1.00

Ammunition Engineering Directorate, Picatinny Arsenal, Dover, N. J.
THEORETICAL CALCULATION OF RF ENERGY RECEIVED FROM A TRANSMITTER BY AN ELECTRO-EXPLOSIVE DEVICE AND COMPUTATION OF SAFE SEPARATION DISTANCES,
by Dusan Georgevich. Oct 64, 19p
Technical memo. no. TM-1326
Unclassified report

Descriptors: (*Explosives initiators, Radiofrequency pulses), (*Radiofrequency pulses, Radio transmitters), Radiofrequency power, Electromagnetic fields, Circuits, Antennas, Electric igniters, Handling, Separation.

A calculation was made of the relationships between the energy emitted by radio frequency (RF) transmitters, that which is received by electroexplosive device (EED) lead wires, and the proportion of the energy which might reach the bridgewire of an EED. (Author)

Patent 3,174,329 Field 19H, 11A

METHOD FOR TESTING ORDNANCE SEALS.
Patent assigned to Navy,
by Samuel H. Kauffman and Frederick D. Vogel.
23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Seals(Stoppers), Test methods), (*Underwater ordnance, Seals(Stoppers)), Pressure vessels, Fluids, Air, Halogenated hydrocarbons, Patents.

The method is for determining the fluid integrity of pressure vessels or underwater ordnance devices. The vessel is charged with Freon-12 gas and enclosed in a test chamber. Air is circulated within the test chamber. This air is tested periodically to see if there is any detectable amount of the test gas in it.

Patent 3,180,226 Field 19F

REPLACEABLE GAS SYSTEM FOR FIREARMS.
Patent assigned to Army,
by John L. Lockhead. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Automatic weapons, Gun components), (*Guns, Gun components), (*Gun components, Patents), Gun barrels, Gases, Cartridges.

The gas system is used with automatic firearms. The gas system is easily removed from a firearm for repair or replacement by removing a pin from one end and pulling a male component away from a complementary female component. The system converts gas pressure produced by discharge of cartridges in the barrel to a mechanical movement.

Patent 3,181,138 Field 19H

ELECTRICAL SOUND SIMULATOR.
Patent assigned to Navy,
by Lloyd D. Anderson. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Sound, Simulators), (*Acoustic equipment, Simulators), Circuits, Voltage, Acoustic properties, Electrical impedance, Patents.

A circuit is provided which has a voltage output varying in amplitude in the same manner as the acoustic pressure signature of a moving sound source, such as a ship passing a hydrophone. An electrical signal simulating the acoustic signature is provided by varying the magnitude of the in-phase component of the voltage in an impedance circuit linearly and directly with time.

Patent 3,181,423 Field 19F

MOTOR DRIVEN AUTOMATIC GUN.
Patent assigned to Army,
by John G. Rocha. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Automatic weapons, Guns), (*Guns, Automatic weapons), Tanks(Combat vehicles), Aircraft, Patents, Gun barrels, Firing mechanisms(Weapon), Electric motors.

The automatic machine gun is for use on tanks or aircraft. The gun is of the type having a longitudinally reciprocable barrel. A single electrically powered drum is capable of mechanically cycling the barrel. The pivotal hammer employed to energize a longitudinal striker is arranged to be cocked by the rearward movement of the barrel into locked battery position thereby preventing the possibility of firing in the event the barrel fails to function properly.

Patent 3,181,427 Field 19F

HYDRAULIC MOTOR CONTROL SYSTEM.
Patent assigned to Army,
by Roland A. Magnuson. 4 May 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Guns, Control systems), (*Hydraulic systems, Guns), Engines + motors, Patents.

The hydraulic motor control system is for use in controlling vehicle mounted guns. The motor is automatically adjusted to suit varying torque requirements encountered in depressing, elevating or traversing the gun. The system includes a constant pressure source and a variable displacement motor for moving varying loads.

Patent 3,181,466 Field 19A, 9A

SPIN COMPENSATING SWITCH FOR A PROJECTILE FUZE.
Patent assigned to Navy,
by Norman Czajkowski. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Electronic switches, Patents), (*Projectile fuzes, Electronic switches), (*Rockets, Spin-stabilized ammunition), Antiaircraft ammunitions, Projectiles, Trajectories.

The switch is used with an anti-aircraft projectile or a spin stabilized rocket. The switch is centrifugally actuated. The switch operates when the differential rate of spin between the initial rate and the rate of spin at which the firing or switch contact is closed has reached a value corresponding to a certain predetermined fractional portion of the trajectory of the projectile.

20. Physics

AD-418 745 Field 20E
CFSTI Price: HC$2.00

Korad Corp., Santa Monica, Calif.
CW SOLID STATE LASERS (NEW FREQUENCIES).
Quarterly rept. no. 1, 1 Mar-31 May 63,
by R. C. Pastor. 31 May 63, 43p
Contract DA36 039AMC00070E, Proj. 3A99 21 001
Unclassified report

Descriptors: (*Lasers, Ruby), (*Frequency, Lasers), Color centers, Crystal growth, Aluminum compounds, Oxides, Impurities, Vanadium, Chromium, Manganese, Physical chemistry, Stability, Titanium compounds, Oxides, Manganese compounds, Strontium compounds, Titanates, Yttrium compounds, Crystal structure, Calcium compounds, Fluorides, Europium, Absorption, Fluorescence, Measurement, Refractory materials.

A study was made of refractory host materials for the purpose of extending the useable portion of the electromagnetic spectrum for lasers. Possible systems based on alpha-Al2O3 are presented. Emphasis in the experimental work was directed to Y2O3, a new refractory host. Preliminary results of crystal growth study and spectroscopic measurements are given. (Author)

AD-436 431 Field 20N, 4A, 20I
CFSTI Price: HC$2.00

IIT Research Inst., Chicago, Ill.
WAVE PROPAGATION UNDER ANOMALOUS CONDITIONS. MEASUREMENT OF THE CHARGE NEUTRALIZATION RATE BETWEEN NO(+) AND O2(-).
Final rept for 15 Jun 62-15 Nov 63,
by Carsten M. Haaland. Nov 63, 39p IITRI-T218-13
Contract DA36 039sc90762 Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Ionosphere, Gas ionization), (*Ionization chambers, Gas ionization), Neutralization, Measurement, Theory, Ionization gages, Ions, Mass spectroscopy, Ionospheric propagation, Wave transmission, Oxygen, Nitrogen compounds, Oxides, Electron density.

An experiment is described for measuring the charge neutralization coefficient between NO(+) and)O2(-). The method employs two rapidly opening mechanical shutters, one between adjacent chambers containing the different ions, and one between the chambers and the analyzing region of a time-of-flight mass spectrometer. The shutters are opened by a gas gun operated outside the vacuum system. The theory of the method and the construction of the apparatus is presented. No measurements have been obtained as yet. (Author)

N65-19283 Field 20K, 11B, 11I
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
INVESTIGATION OF DAMAGE TO BRITTLE MATERIALS BY IMPACT WITH HIGH-VELOCITY PROJECTILES INTO GLASS AND LUCITE,
by James H. Diedrich and Francis S. Stepka.
Mar 65, 38p NASA-TN-D-2720
Unclassified report

Descriptors: (*Impact shock, Materials), (*Glass, Impact shock), (*Acrylic resins, Impact shock), Brittleness.

N65-19919 Field 20D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EXPERIMENTALLY DETERMINED PENDULUM ANALOGY OF LIQUID SLOSHING IN SPHERICAL AND OBLATE-SPHEROIDAL TANKS,
by Irving E. Sumner. Apr 65, 24p NASA-TN-D-2737
Unclassified report

Descriptors: (*Sloshing, Mathematical analysis), (*Propellant tanks, Sloshing).

NCH-100 018 Field 20L, 9A

National Bureau of Standards, Washington, D. C.
BIBLIOGRAPHY ON THE MEASUREMENT OF BULK RESISTIVITY OF SEMICONDUCTOR MATERIALS FOR ELECTRON DEVICES,
by Judson C. French. 21 Oct 64, 124p
Technical Note no. TN-232
ARPA Order 373 62
Unclassified report

Research supported in part by Air Force Cambridge Research Labs., Bedford, Mass. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60, as C 13.46:232.

Descriptors: (*Semiconductors, Bibliographies), (*Resistance(Electrical), Semiconductor devices), (*Materials, Semiconductors), Germanium, Silicon, Measurement, Standardization.

In support of a study of accurate measurements of the bulk resistivity of semiconductor materials such as germanium and silicon which are used in electron devices,

a literature search has led to the development of a rather large collection of references. The file cards making up the bibliography are reproduced in this Technical Note for the assistance of others who are concerned with the improvement and standardization of these measurements. (Author)

NCH-100 020 Field 20N, 4A, 8N, 12A

National Bureau of Standards, Boulder, Colo. Central Radio Propagation Lab.
A COMPLETE MODE SUM FOR LF, VLF, ELF TERRESTRIAL RADIO WAVE FIELDS,
by J. Ralph Johler and Leslie A. Berry. 1 Oct 64, 27p
NBS M-78
Unclassified report

Paper presented at the VLF Symposium, Boulder, Colo., 12 Aug 63. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20, as C-13.44:78.

Descriptors: (*Radio fields, Ionospheric propagation), (*Ionospheric propagation, Radio fields), Radio waves, Low frequency, Very low frequency, Extremely low frequency, Terrestrial magnetism, Magnetic fields, Atmosphere models, Electromagnetic wave reflections, Electron density, Ionospheric disturbances, Partial differential equations, Tensor analysis.

Previous papers about VLF, ELF propagation in the earth-ionosphere waveguide have emphasized the characteristics of the individual modes. In this paper, emphasis is on the total field found by summing all modes which contribute appreciably. Solutions are given and calculations are made for a homogeneous isotropic ionosphere with a constant radial magnetic field imposed, and an ionosphere with a magnetic field of arbitrary dip angle. In the isotropic case, one mode is sufficient to describe the field at ELF, but at the upper end of the VLF band, two or more modes may propagate 7500 km. When a magnetic field is imposed on the ionosphere, three abnormal modes or fields are generated at the anisotropic boundary. These abnormal modes have little effect on the total field in the VLF band, but they change the ELF field appreciably. Indeed, in the absorption region between VLF and ELF, the abnormal modes may become dominant beyond 1000 km. (Author)

Patent 3,180,208 Field 20F, 19E

OPTICAL RANGE FINDING DEVICE.
Patent assigned to Army,
by Martin D. Swartz and Paul M. marasco. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Range finding, Optical equipment), (*Optical equipment, Range finding), Design, Patents.

The optical range finding mechanism is for determining distance of a target. The mechanism includes a stereo reticle pattern, elements for observing the target and the reticle pattern, a compensating lens and an arrangement for positioning the lens to create an illusion that the target and reticle pattern are located at the same distance from an observer.

Patent 3,182,176 Field 20I, 13H, 14B

ARC PLASMA GENERATOR.
Patent assigned to Navy,
by Edgar A. Bunt and Herman L. Olsen. 4 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Plasma physics, Electric arcs), Electrodes High-temperature research, Patents, Plasma medium, Production.

The arc plasma generator continuously produces a high pressure, high temperature plasma discharge. The plasma discharge can be used for testing materials, cutting, welding, metal spraying, chemical processing, and as a heat source for wind tunnel facilities capable of simulating hypersonic flight. Concentrically disposed, circular electrodes are used.

PB-167 566 Field 20I, 20C, 20D
CFSTI Prices: HC$2.00 MF$0.50

Case Inst. of Tech., Cleveland, Ohio.
RAYLEIGH'S PROBLEM IN MAGNETOGASDYNAMICS WITH HALL EFFECT,
by Pau-Chang Lu. 1965, 37p Unclassified report
Grant NSF G19000

Descriptors: (*Magnetohydrodynamics, Hall effect), (*Gas flow, Magnetohydrodynamics), Compressible flow, Boundary layer, Argon, Plasma medium, Reynolds number, Partial differential equations, Numerical methods and procedures.

The boundary-layer solutions for large times of the velocity and temperature distributions in a gas, induced by the impulsive motion of an infinite flat plate in its own plane are obtained by using the Karman-Pohlhausen technique. The gas is assumed to be thermally ionized through a combination of dissipative effects and heat supplied at the plate. Two examples are given for seeded argon at about 2500K: one with Hall effect (strong magnetic field), and one without. An example of the corresponding incompressible problem is solved both approximately and exactly, to throw some light on the possible error involved in applying the Karman-Pohlhausen technique to the present problem. (Author)

PB-167 605 Field 20M, 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE ACCURACY OF IMPLICIT DIFFERENCE APPROXIMATIONS TO THE EQUATION OF HEAT FLOW,
by Wolfgang Wasow. 15 Apr 57, 22p
Technical summary rept. no. MRC-TSR-2
Contract DA11 022ORD2059 Unclassified report
AD 147 633

Descriptors: (*Heat transfer, Difference equations), (*Difference equations, Heat transfer), Partial differential equations, Diffusion, Numerical methods and procedures, Errors.

The convergence, stability, and the truncation error of implicit difference approximations to the initial value problem defined by the partial differential equation of heat flow.

PB-167 607 Field 20D, 12A
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

DETERMINATION OF THE VORTICITY AND THE GRADIENTS OF FLOW PARAMETERS BEHIND A THREE-DIMENSIONAL UNSTEADY CURVED SHOCK WAVE,
by Ram P. Kanwal. 8 Nov 57, 15p
Technical summary rept. no. MRC-TSR-12
Contract DA11 022ORD2059
AD 160 673

Unclassified report

Descriptors: (*Shock waves, Vortices), (*Partial differential equations, Three-dimensional flow), Non-equilibrium flow, Density, Tensor analysis, Differential geometry.

Results are generalized regarding the determination of the gradients of flow parameters to the case of unsteady flows by a method used previously on steady and pseudo-stationary flows.

PB-167 614 Field 20L
CFSTI Prices: HC$2.00 MF$0.75

Stanford Electronics Labs., Stanford Univ., Calif.
STUDIES OF MICROPLASMAS AND HIGH-FIELD EFFECTS IN SILICON.
Final rept. for 1 Feb 60-31 Oct 63,
by John L. Moll and Chun-Yuan Duh. Feb 64, 47p
SEL-64-009
Contract DA36 039sc85339
AD 433 781

Unclassified report

Descriptors: (*Silicon, Plasma physics), Transistors, Phonons, Electrons, Electric fields, Ionization potentials, Theory, Ionization, Solid state physics.

A calculation of breakdown voltage is presented for various types of junctions using the most recent and probably the most accurate measurements available for electron and hole ionization rates. In addition, there is a calculation of multiplication at voltages less than the breakdown voltage. This calculation is useful to obtain the BV sub CE for n-p-n and p-n-p transistors. It is found that for similar collectors, the BV sub CE for an n-p-n transistor is about half the value for a p-n-p transistor.

21. Propulsion and Fuels

AD-458 430 Field 21D, 6M, 11F
CFSTI Price: HC$4.00

Melpar, Inc., Falls Church, Va.
MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION.
Quarterly progress rept. no. 4, 1 Feb-1 Jun 64,
by Gordon C. Blanchard and Charles R. Goucher.
Feb 65, 131p
Contract AF33 657 9186, Proj. 3048, Task 304801

Unclassified report

See also AD-614 133.

Descriptors: (*Fuel contamination, Microorganisms), (*Jet engine fuels, Contamination), (*Corrosion, Aluminum), (*Aluminum alloys, Corrosion), Surface-active substances, Fuel systems, Water, Degradation, Corrosion inhibition; Nitrates, Phosphates, Proteins, Peptides, Amino acids, Hydrocarbons, Colloids, Metabolism, Growth, Respiration, Viability, Coatings.

Progress was made in understanding and partially solving the problem of jet fuel contaminants, including microorganisms, surface-active materials, iron rust, water, and extraneous materials as they pertain to fuel properties, sludge formation, and the corrosion and degradation of materials in aircraft fuel systems. A study of the corrosion in simulated water bottoms revealed that ions, such as iron and calcium, cause aluminum corrosion. Other ions in the media, such as nitrate and phosphate, prevented aluminum corrosion. Aluminum corrosion was also caused by another mechanism as revealed by the corrosion produced by the growth of fuel isolates in media containing protein, peptides, and amino acids. This type of corrosion was not inhibited by nitrate. Metabolic mechanisms which operate in the production of fuel contaminants such as emulsions and sludges were also studied. Compounds produced by microorganisms grown in fuel were isolated and partially characterized. An effective method of controlling the microorganisms in fuel was discovered. The respiration and viability of these isolates were especially sensitive to inhibition by short-chain unsaturated hydrocarbons. The breakdown of coatings on aluminum was correlated with microbial growth. Microorganisms utilized these coating materials as sources of nitrogen and carbon for growth. Several different detector systems were applied to the study of fuel contamination and corrosion.

N65-16589 Field 21C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EXPERIMENTAL INVESTIGATION OF A CONSTANT-VELOCITY TRAVELING MAGNETIC WAVE PLASMA ENGINE,
by Robert E. Jones and Raymond W. Palmer.
Feb 65, 24p NASA-TN-D-2676

Unclassified report

Descriptors: (*Ion engines, Magnetic fields), Velocity, Magnetic cores.

Patent 3,177,553 Field 21I, 13H

APPARATUS FOR SOLVENT-ISOSTATIC PRESSING.
Patent assigned to AEC,
by Paul B. Archibald. 13 Apr 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Rocket propellant grains, Presses-(Machinery)), Powder metals, Aluminum, Ammonium compounds, Nitrates, Mixtures, Organic solvents, Mandrels.

The apparatus can be used for pressing crystalline organic compounds such as trinitrobenzene, salts such as ammonium nitrates and mixtures of these with powdered metals such as aluminum. Apparatus is shown for pressing rocket propellant grains. The solvent-isostatic pressing apparatus is used for the production of variously shaped compacts by disposing a suitably shaped mandrel within the flexible bag, and disposing the solvent and charge material around the mandrel.

Patent 3,180,770 Field 21I, 19A

PROPELLANT FUEL CONTAINING MAGNESIUM ALUMINUM ALLOY.
Patent assigned to Army,

by George J. Mills, Warren L. Dowler and Derck A. Gordon. 27 Apr 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Solid rocket fuels, Patents), (*Aluminum alloys, Solid rocket propellants), (*Magnesium alloys, Solid rocket propellants), (*Explosive materials, Solid rocket fuels), Solid rocket propellant binders, Solid rocket oxidizers.
The aluminum-magnesium alloy is useful as a fuel in rocket propellant and explosive compositions. The composition contains a cured intimate admixture of a polyurethane binder, metallic fuel particles and an oxidizer. The particles consist of 38 to 63 percent by weight of magnesium and the remainder aluminum.

Patent 3,181,246 Field 21H

METHOD AND APPARATUS FOR DETERMINING THE INTEGRITY OF A SOLID PROPELLANT ROCKET MOTOR.
Patent assigned to Army,
by Lonnie W. Jenkins and Thomas H. Pratt. 4 May 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Rocket motors(Solid propellant), Nondestructive testing), Transducers, Patents.

The electro-mechanical device is for the nondestructive testing of case-bonded solid propellant motors. Transducers are utilized which translate mechanical movement into electrical potential so as to measure deviations in the profile of a perforation in a solid propellant motor for detection of any flaws therein. The transducers act as differential transformers and have spring loaded feeler balls attached thereto. The transducers and feeler balls are mounted on a trolley and the trolley is in turn mounted on a beam placed concentrically in the motor perforation. Movement of the balls produces a signal which is fed through an amplifier to a recorder to obtain a trace of the profile of the grain.

Patent 3,181,509 Div. 21G

SEALING MEANS FOR ROTARY ENGINES.
Patent assigned to Navy,
by Lewis B. Simon. 4 May 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Seals(Stoppers), Internal combustion engines), (*Rotary seals, Combustion chambers), Engines + motors, Pistons, Patents.

The rotary internal combustion engine has a rotor eccentrically mounted within the casing. The seal provides a complete seal between the sides of the piston and the end walls of the casing. A radial groove is employed at the side of the piston which extends all the way to the rocking portion of the piston with a side member disposed therein and engaging the piston so as to allow for the rocking action.

22. Space Technology

AD-454 469 Field 22C, 20I
CFSTI Price: HC$2.00

Physical Studies, Inc., Kettering, Ohio.

RVIP REENTRY RADIATION MEASUREMENTS. A. THEORETICAL BACKGROUND,
by R. G. Breene, Jr. 6 Aug 64, 55p
Scientific rept. no. SR-1
Contract AF19 628 2426, Proj. 6327, ARPA 254
AFCRL 64-691 PA
Unclassified report

Descriptors: (*Reentry vehicles, Radiation damage), (*Plasma physics, Reentry vehicles), Gas ionization, Bremestrahlung, Electrons, Polarization, Phase shift, Atmosphere entry, Plasma sheath.

The theoretical background for interpretation of the observed re-entry radiation is discussed in detail. The overall categories are free-free, free-bound and bound-bound radiation, the important subdivisions being here considered extensively. The general progress, both theoretical and experimental in the various radiation are reported to a limited extent. (Author)

N65-16448 Field 22C
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
PARAMETRIC PERFORMANCE ANALYSIS FOR LUNAR ORBIT BRAKING AND DESCENT,
by Charles M. Akridge and Sam H. Harlin. Feb 65, 66p NASA-TN-D-2643
Unclassified report

Descriptors: (*Lunar trajectories, Lunar surface vehicles), Descent trajectories, Parking orbits, Transfer trajectories.

Patent 3,176,933 Field 22B, 11C

THERMAL CONTROL OF SPACE VEHICLES.
Patent assigned to NASA,
by Dewey L. Clemmons, Jr. 6 Apr 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Satellites(Artificial), Temperature control), Communications satellites(Passive), Patents, Phosphate coatings, Aluminum, Surfaces, Laminates, Composite materials, Inflatable structures, Polyester plastics, Foils.

The space vehicle is of the type similar to the Echo I satellite. It is carried into space in the nose cone of a missile. The vehicle has an exterior aluminum surface. A thickness of the aluminum surface is chemically converted into an amorphous phosphate layer.

Patent 3,178,883 Field 22C, 22B

ATTITUDE CONTROL FOR SPACECRAFT.
Patent assigned to NASA,
by Frank F. Batsch, John Laub, and Francis R. Mitchell.
20 Apr 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Spacecraft, Attitude control systems), (*Attitude control systems, Spacecraft), Design, Patents.
The attitude control is installed on a space vehicle. A jetting device expels a gas on command from the space ship or from a remote station. A set of the devices are mounted to control the yaw, roll and spin axes. Each control unit is connected to a source of air or gas pressure.

Patent 3,180,264 Field 22B

COUPLING FOR LINEAR SHAPED CHARGE.
Patent assigned to NASA,
by Homer T. Armstrong. 27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Shaped charges, Couplings), (*Couplings, Shaped charges), Abort, Spacecraft, Patents.

The coupling is associated with a linear shaped charge in the abort system used to destroy a space vehicle upon malfunction of the vehicle. The coupling is used to join the shaped charge, the booster charge, and a squib into a compact unit. The coupling is designed such that the shaped charge is received at one end and the squib at the other end. The booster charge is housed by the coupling intermediate the ends of the shaped charge and the squib.

Patent 3,180,587 Field 22C

ATTITUDE ORIENTATION OF SPIN-STABILIZED SPACE VEHICLES.
Patent assigned to NASA,
by Howell D. Garner and Henry J. E. Reid, Jr.
27 Apr 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Spacecraft, Attitude control systems), (*Attitude control systems, Spacecraft), Signals, Celestial navigation, Patents, Stabilization systems, Solenoids.

The attitude control system is utilized in a spin-stabilized space vehicle. A scanner is mounted in the vehicle for rotation with it. A signal generating device is associated with the scanner for generating a signal in response to sighting of a horizon. The signal generator is associated with a solenoid device and a gas source to forcibly vary the vehicle attitude. Celestial bodies are used in the system for determining position.

PB-167 393 Field 22B, 11A, 11F
CFSTI Prices: HC$3.00 MF$0.75

Space Sciences Lab., Litton Systems, Inc.,
Beverly Hills, Calif.
CABIN SEALING OF AEROSPACECRAFT.
Final rept. for 1 May 61-1 May 62,
by Harold J. Greenspan and Daniel L. Curtis. Feb 63,
84p Rept. no. 2272
Contract AF33 616 8166, Proj. 1368, Task 136805
ASD TDR-62-661; AD 402 606
Unclassified report

Descriptors: (*Aerospace craft, Gas seals), (*Gas seals, Spacecraft cabins), Gas leaks, Air, Oxygen, Nitrogen, Porosity, Aluminum alloys, Beryllium alloys, Titanium alloys, Niobium alloys, Stainless steel, Nickel alloys, Seals.

The permeation rates of air, oxygen, and nitrogen through various metals and metallic structural elements suitable for use in the construction of an aerospacecraft were simulated by providing a vacuum of 10 to the minus 6th power mm Hg on one surface of the test specimen and the test gas on the other surface. Results show that for temperatures up to 400F, permeability rates of engineering significance do not exist. (Author)

PB-167 600 Field 22C, 8N
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin,
Madison.
THEORY OF THE MOTION OF ARTIFICIAL SATELLITES, III,
by Zdenek Kopal. Oct 58, 34p
Technical summary rept. no. MRC-TSR-52
Contract DA11 022ORD2059
AD 208 000
Unclassified report

Descriptors: (*Satellites(Artificial), Motion), (*Motion, Theory), Potential theory, Rotation, Geophysics, Celestial mechanics, Special functions(Mathematical).

PB-167 616 Field 22A, 6S, 17G, 17B, 22B
CFSTI Prices: HC$8.45 MF$2.50

Aerospace Corp., Los Angeles, Calif.
TRANSACTIONS OF THE SYMPOSIUM ON BALLISTIC MISSILE AND SPACE TECHNOLOGY (9th) HELD AT THE UNITED STATES NAVAL TRAINING CENTER, SAN DIEGO, CALIFORNIA ON 12-14 AUGUST 1964. VOLUME I, KEYNOTE ADDRESS, COMMAND AND CONTROL, SPACE COMMUNICATIONS, SPACE NAVIGATION, SPACE STATION DESIGN FACTORS, PHYSIOLOGICAL CONSIDERATIONS.
1964, 544p
AD 453 500
Unclassified report

See also PB-167 617.

Descriptors: (*Command + control systems, Symposia), (*Symposia, Command + control systems), (*Space communication systems, Symposia), (*Space navigation, Symposia), (*Space stations, Symposia), Psychology, Performance(Human), Human engineering, Communication satellites, Military satellites, Coding, Space medicine.

Contents: Command and Control from the National Point of View; Parametric Analysis of an Integrated Tracking, Telemetry, and Command System; Military vs Commercial Communication Satellites; Establishment and Replenishment Calculations for Satellite Systems; Retrodirective Arrays for Military Communication Satellites; The Use of Frequency Selective Limiters in Communication Satellites; Gravity-Gradient Attitude Stabilization for Communication Satellites; Composite Coding Communications; A Comparison of Kay Parameters of Three CW Ranging Systems; Horizon Sensor Navigation Errors Resulting from Statistical Variations in the CO2 14-16 Micron Radiation Band; A Numerical Comparison of Two Orbit Determination Methods; Optimal Guidance and Control Synthesis for Maneuverable Lifting Space Vehicles, Stability and Control Considerations in the Deployment of a Gable-Connected Spinning Space Station; Redundancy/Maintenance Cost Optimization for Manned Orbital Space Stations; Physiological Considerations on Maintenance of Muscle Tone Under Subgravity Conditions.

PB-167 617 Field 22A, 15D, 22B, 22C, 22D
CFSTI Prices: HC$8.20 MF$2.50

Aerospace Corp., Los Angeles, Calif.
TRANSACTIONS OF THE SYMPOSIUM ON BALLISTIC MISSILE AND SPACE TECHNOLOGY (9th) HELD AT THE UNITED STATES NAVAL TRAINING CENTER, SAN DIEGO, CALIFORNIA ON 12-14 AUGUST 1964. VOLUME II, LAUNCH SYSTEM CONSIDERATIONS, RE-ENTRY AND RECOVERY, MATERIALS, BLAST SIMULATION, INSPECTION, SPACE STATION LOGISTICS.

1964, 520p
AD 453 501

Unclassified report

See also PB-167 616.

Descriptors: (*Symposia, Guided missiles), (*Symposia, Spacecraft), (*Guided missiles, Symposia), (*Spacecraft, Symposia), Recoverable booster motors, Launch vehicles-(Aerospace), Malfunction, Detection, Command + control systems, Reentry vehicles, Maneuverability, Tactical weapons, Boost-glide vehicles, Aerodynamic heating, Aerodynamic configurations, Design, Hypersonic characteristics, Recovery, Conical bodies, Parachutes, Heat shields, Polymers, Expanded plastics, Extendable structures, Nuclear explosions, Simulation, Blast, Space surveillance systems, Aerial cameras, Space station, Logistics.

Contents: Launch System Considerations--The Economic Feasibility of the Rocket Approach to Reusable Launch Systems, Application of Emergency Detection and Decision Systems to Launch Vehicles; Reentry and Recovery--Maneuver Characteristics of a Tactical Re-entry Vehicle with an Offset Center of Gravity, Determination of Re-entry Performance of the M-2 Lifting Body Based on Aerodynamic Heating Considerations, Considerations in the Design of Vehicles Capable of Substantial Hypersonic Lift-Drag Ratios, Hypersonic Dynamic Stability of Sharp and Blunt Slender Cones, The ASSET Recovery System, The Apollo Earth Landing System; Materials--Heat Protection by Radiative Heat Rejection, Polymers in Missiles and Space, Expandable Structures for Space Applications; Blast Simulation--Explosive Simulation of Nuclear Blast on Test Vehicles, A Technique for Simulating Air-Blast-Induced Ground Motions, and others.

SUBJECT INDEX

The fields indicated here apply only to the other Research Reports and Related Material Section (on blue paper).

DESCRIPTOR	FLD	ACCESS. NO.
ABANDONMENT	01	PB-167 551
ACCELERATION TOLERANCE	06	AD-436 809
ACCELEROMETERS	14	PAT-3176800
ACOUSTIC EQUIPMENT	19	PAT-3181138
ADHESIVES	11	PAT-3180742
AEROSPACE CRAFT	01	PAT-3179360
	22	PB-167 393
AIR CONDITIONING EQUIPMENT	13	PAT-3181844
AIR POLLUTION	13	PB-167 552
AIR TRAFFIC CONTROL SYSTEMS	17	PB-167 547
AIRCRAFT ANTENNAS	09	PAT-3179942
AIRCRAFT CANOPIES	01	PAT-3180082
ALGEBRA	12	PB-167 582
	09	PB-167 589
ALGEBRAIC TOPOLOGY	12	AD-296 365
ALUMINUM	13	PAT-3179582
ALUMINUM ADDITIVES	11	PAT-3180827
ALUMINUM ALLOYS	21	AD-458 430
	21	PAT-3180770
AMIDES	11	PAT-3180830
ARMED FORCES OPERATIONS	15	PB-167 553
AROMATIC COMPOUNDS	11	PAT-3180829
ARRESTING GEAR	01	PAT-3170358
ARTIFICIAL PRECIPITATION	04	PB-167 561
ATMOSPHERIC PRECIPITATION	04	PB-167 511
ATTITUDE CONTROL SYSTEMS	22	PAT-3178883
	22	PAT-3180587
AUTOMATIC WEAPONS	19	PAT-3180226
	19	PAT-3181423
AVIATION ACCIDENTS	01	PB-167 551
AXIAL-FLOW COMPRESSOR BLADES	10	PAT-3181835
BALLAST TANKS	16	PAT-3181422
BARIUM COMPOUNDS	09	PB-167 487
BATTERIES AND COMPONENTS	10	AD-439 994
BAYS	08	PB-167 261
BIBLIOGRAPHIES	05	PB-167 377
	05	PB-167 378
	05	PB-167 513
	05	PB-167 520
	12	PB-167 598
BIRDS	06	PB-167 523
	06	PB-167 524
	06	PB-167 525
	06	PB-167 526
	06	PB-167 527
	06	PB-167 528
	06	PB-167 529
BORIDES	11	AD-285 313
	11	AD-409 923
BUOYS	08	PAT-3178736
CALCULUS OF VARIATIONS	12	PB-167 583
CAPACITORS	09	PB-167 487
CARBIDES	11	AD-285 313
	11	AD-409 923
	18	PAT-3179722
CARBOXYLIC ACIDS	11	PAT-3183187
CARTRIDGES (PAD)	06	PB-167 326
CATHODIC PROTECTION	13	PAT-3179582
CATALOGS	05	PB-167 447
CELLULOSE	07	AD-420 477
CERAMIC CAPACITORS	09	PB-167 487
CERAMIC COATINGS	11	PAT-3181964
CERAMIC MATERIALS	13	PAT-3180756
	09	PB-167 636
CHEMICAL BONDS	07	AD-420 477
CLASSIFICATION	05	AD-299 236
	05	PB-167 449
CLIPPER CIRCUITS	09	PAT-3181076
CLOUDS	04	PB-167 561
CODING	09	PB-167 515
COMBINATORIAL ANALYSIS	12	PB-167 602
COMMAND AND CONTROL SYSTEMS, SYMPOSIA	22	PB-167 616
COMMUNICATION THEORY	12	AD-409 554
	09	PB-167 515
COMPLEX COMPOUNDS	11	PAT-3180831
CONTROL	12	AD-409 554
COPPER COATINGS	13	PAT-3180756
CORROSION	21	AD-458 430
CORROSION INHIBITION	11	PAT-3181929
COUPLING CIRCUITS	09	AD-402 852
COUPLINGS	22	PAT-3180264
CROSSED FIELD DEVICES	09	AD-450 300
CRYSTAL OSCILLATORS	09	AD-403 528
CRYSTAL HOLDERS	09	PB-167 619
CUMULUS CLOUDS	04	PB-167 549
CUTTING FLUIDS	11	PAT-3180830
DAMPING	14	PAT-3176800
DATA PROCESSING SYSTEMS	06	PB-167 442
DATA TRANSMISSION SYSTEMS	09	AD-448 494
DECISION THEORY	12	PB-167 516
DIELECTRICS	09	PB-167 636
DIFFERENCE EQUATIONS	20	PB-167 605
DIGITAL RECORDING SYSTEMS	05	PB-167 576
DIGITAL SYSTEMS	09	AD-448 494
DIODES (SEMICONDUCTOR)	09	PAT-3178659
	09	PB-167 635
DISPLAY SYSTEMS	17	PB-167 547
DOCUMENTATION	05	AD-299 236
	05	PB-167 376
	05	PB-167 519
	05	PB-167 521
DOSIMETERS	06	PAT-3179581
EARTHQUAKES	08	PB-167 506
	08	PB-167 563
ECONOMICS	05	PB-167 455
EDUCATION	05	PB-167 519
	05	PB-167 638
ELECTRIC CONNECTORS	09	PAT-3182280
ELECTRIC TERMINALS	09	AD-289 205
ELECTROACOUSTIC TRANSDUCERS	09	PAT-3182284
ELECTROCHEMISTRY	06	PAT-3179581
ELECTROMAGNETIC WAVES	19	AD-433 000
ELECTRONIC SWITCHES	19	PAT-3181466
ELECTRONICS	09	PB-167 591
ENERGY CONVERSION	10	PB-167 575
EXPLOSIVE ACTUATORS	06	PB-167 326
EXPLOSIVE MATERIALS	21	PAT-3180770
EXPLOSIVES INITIATORS	19	AD-450 567
FACSIMILE EQUIPMENT	14	AD-434 382
FIBER OPTICS	14	AD-434 382
FILMS	09	PB-167 487
FILTERS (ELECTROMAGNETIC WAVE)	09	AD-402 852
FLAME SPRAYING	11	PAT-3181964
FLEXIBLE COUPLING	13	PAT-3177017
FLOATS	13	PAT-3179962
FUEL CONTAMINATION	21	AD-458 430
FUEL OIL	05	PB-167 455
FUNCTIONAL ANALYSIS	12	PB-167 583
	12	PB-167 585
	09	PB-167 591
	12	PB-167 598
	12	PB-167 609
FURNACES	13	PAT-3179731
GAS FLOW	20	PB-167 566
GAS SEALS	22	PB-167 393
GASES	07	AD-291 420
	11	PAT-3181929
GENERATORS	10	PB-167 596
GEODESICS	08	PB-167 499
	08	PB-167 506
	08	PB-167 541
GEOPHYSICS	08	PB-167 570
GLASS	13	PAT-3179731
GLASS CAPACITORS	09	PB-167 636
GREASES	11	PAT-3180827
	11	PAT-3183187
GUIDANCE	17	PAT-3180296
GUIDED MISSILE LAUNCHERS	16	PAT-3180222
GUIDED MISSILES	16	PAT-3181422
GUIDED MISSILES (UNDERWATER-TO-SURFACE)	16	PAT-3180225
GUN COMPONENTS	19	PAT-3180226
GUNS	19	PAT-3180226
	19	PAT-3181423
	19	PAT-3181427
GYROSCOPES	14	PAT-3176800
HEAT TRANSFER	20	PB-167 605
HELICOPTERS	17	PAT-3181152
HOMING DEVICES	17	PAT-3181813
HUMIDITY	13	PAT-3181844
HYDRAULIC SYSTEMS	19	PAT-3181427
HYDROGRAPHIC SURVEYING	08	PB-167 261
	08	PB-167 502
ICE	04	PB-167 561
INDEXES	05	PB-167 441
	05	PB-167 513
INEQUALITIES	12	AD-418 386
	12	PB-167 604
INFORMATION RETRIEVAL	05	PB-167 305
	05	PB-167 359
	05	PB-167 377
	05	PB-167 378
	05	PB-167 440
	05	PB-167 492
	05	PB-167 513
INPUT-OUTPUT DEVICES	09	AD-448 494
INTERFEROMETERS	17	PAT-3181813
ION EXCHANGE RESINS	07	PB-167 577
IONIZATION CHAMBERS	20	AD-436 431
IONOSPHERE	20	AD-436 431
	04	PB-167 545
	04	PB-167 590
IONOSPHERIC PROPAGATION	20	NCH-100 020
	04	PB-167 545
IONOSPHERIC PROPOGATION	04	PB-167 590
ITERATIVE METHODS	12	PB-167 517
JET ENGINE FUELS	21	AD-458 430
JETTISONABLE COCKPITS	06	PB-167 326
JOINTS	13	PAT-3177017
LABORATORY ANIMALS	06	PAT-201010
LAMINATED PLASTICS	11	PAT-3179531
LANDING FIELDS	11	PB-167 322
LANGUAGE	05	PB-167 358
	05	PB-167 444
	05	PB-167 491
	05	PB-167 567
LAUNCHING	16	PAT-3180222
	16	PAT-3180225
LEADERSHIP	05	AD-446 448
LIBRARIES	05	PB-167 359
	05	PB-167 447
	05	PB-167 449
LIFE EXPECTANCY	10	PB-167 292
LINEAR PROGRAMMING	12	AD-418 366
LIQUIDS	07	AD-291 420
LOCKING FASTENER DEVICES	06	PB-167 326
LOGISTICS	12	AD-296 365
	15	PB-167 601
LUBRICANT ADDITIVES	11	PAT-3178368
	11	PAT-3180827
	11	PAT-3182022
	11	PAT-3182024
LUBRICANTS	11	PAT-3180831
	11	PAT-3182023
	11	PAT-3183187
MACHINE TRANSLATION	05	PB-167 491
	05	PB-167 558
	05	PB-167 559
MAGNESIUM ALLOYS	21	PAT-3180770
MAGNESIUM COMPOUNDS	11	PAT-3181964
MAGNETIC AMPLIFIERS	09	PAT-3177447
MAGNETIC TAPE	14	PAT-3179533
MAGNETOHYDRODYNAMICS	20	PB-167 566
MANAGEMENT PLANNING	05	PB-167 474
MANPOWER STUDIES	05	NCH-130 022
MAP PROJECTION	08	PB-167 530
MAPPING	08	PB-167 536
	08	PB-167 540
MARINE BIOLOGY	08	PB-167 259
	08	PB-167 522
MARINE GEOPHYSICS	08	PB-167 564
MATERIALS	18	AD-285 554
	20	NCH-100 018
MATHEMATICAL MODELS	15	PB-167 601
MATHEMATICS	12	AD-409 554
MATRIX ALGEBRA	12	PB-167 604
	12	PB-167 606
MECHANICAL DRAWINGS	09	AD-441 184
MEDICINE	06	PB-167 442
MEMBRANES	07	PB-167 577
METEOROLOGICAL PARAMETERS	04	PB-167 511
	04	PB-167 548
METEOROLOGICAL SATELLITES	04	PB-167 549
METEOROLOGY	04	PB-167 549
MEXICO GULF	08	PB-167 261
MICROMINIATURIZATION (ELECTRONICS)	09	AD-431 161
MICROWAVE NETWORKS	09	AD-402 852
MODULATORS	09	AD-430 958
MODULES (ELECTRONICS)	09	AD-431 161
MOON	17	NCH-100 019
MOTION	22	PB-167 600
MOTIVATION	05	AD-446 448
MOUNTING BRACKETS	09	PAT-3182115
N-METEROCYCLIC COMPOUNDS	11	PAT-3182924
NAVAL RESEARCH LABORATORIES	14	PB-167 330
NAVIGATION CHARTS	08	PB-167 535
NAVIGATIONAL AIDS	17	PAT-3181152
NETWORKS	12	AD-296 365
NITROGEN COMPOUNDS	18	AD-285 564
NONLINEAR PROGRAMMING	12	PB-167 599
NONLINEAR SYSTEMS	09	PB-167 591
NUCLEAR MAGNETIC RESONANCE	07	AD-420 477
NUMBER THEORY	12	PB-167 609
NUMERICAL ANALYSIS	12	PB-167 585
NYLON	11	PB-167 557
OCEANOGRAPHIC DATA	08	PB-167 260
	17	PB-167 504
OILS	11	PAT-3180829
OINTMENTS	11	PAT-3180827
OPTICAL COATINGS	10	AD-401 872
OPTICAL EQUIPMENT	20	PAT-3180208
OPTICAL SCANNING	14	AD-434 382
OPTIMIZATION	12	PB-167 517
PACIFIC OCEAN	08	PB-167 260
PAINTS	11	PB-167 322
PARTIAL DIFFERENTIAL EQUATIONS	20	PB-167 607
PERIODICALS	05	PB-167 308
	05	PB-167 309
	05	PB-167 441
	05	PB-167 520
PHENOLS	11	PAT-3178368
PHOTOCHEMISTRY	07	PB-167 477
PHOTOGRAPHIC EQUIPMENT	14	PAT-3179350
PHYSICS	05	PB-167 521
PIPES	11	PB-167 557
PLANKTON	08	PB-167 259
PLANTS (BOTANY)	02	PAT-3180340
	08	PB-167 522

DESCRIPTOR	FLD	ACCESS. NO.
PLASMA PHYSICS	22	AD-454 469
	20	PAT-3182176
POLAR REGIONS	04	PB-167 545
	04	PB-167 590
POLYMERS	07	PB-167 479
POSITION FINDING	06	PB-167 502
PRIMARY CELLS	10	AD-439 994
PRINTED CIRCUITS	09	PB-167 610
PROGRAMMING (COMPUTERS)	05	PB-167 492
PROJECTILE FUZES	19	PAT-3181466
PSYCHOLOGY	05	PB-167 445
	05	PB-167 446
PULSE MODULATION	09	PAT-3181071
QUARTZ RESONATORS	09	PB-167 619
RADAR	09	PB-167 390
RADAR ANTENNAS	09	PB-167 390
RADAR DUPLEXERS	09	PB-167 635
RADAR EQUIPMENT	17	PAT-3181139
RADAR TARGETS	17	PAT-3177485
RADAR TRACKING	17	PAT-3177485
RADIATION CHEMISTRY	18	AD-285 564
RADIATION MEASUREMENT SYSTEMS	06	PAT-3179581
RADIO COMMUNICATION SYSTEMS	17	NCH-100 019
RADIO FIELDS	20	NCH-100 020
RADIOFREQUENCY OSCILLATORS	09	PAT-3181071
RADIOFREQUENCY PULSES	19	AD-450 567
RADOMES	11	PAT-3179531
RAILROADS	13	PB-167 714
RANGE FINDING	20	PAT-3182208
REACTOR FUEL PROCESSING	18	PAT-3179722
	18	PAT-3181700
REELS	14	PAT-3179350
REENTRY VEHICLES	22	AD-454 469
REFRACTIVE INDEX	08	PB-167 499
REFRACTORY COATINGS	11	PAT-3181964
REFRACTORY MATERIALS	11	AD-285 313
	11	AD-400 299
	11	AD-409 923
REINFORCING MATERIALS	14	PAT-3179533
RELAXATION OSCILLATORS	09	PAT-3177447
RELAYS	09	PB-167 618
REMOTE CONTROL SYSTEMS	09	PAT-3181038
REPORTS	05	PB-167 444
	05	PB-167 446
RESISTANCE (ELECTRICAL)	20	NCH-100 018
ROCKET MOTOR NOZZLES	11	AD-285 313
	11	AD-400 299
	11	AD-409 923
ROCKET MOTORS (SOLID PROPELLANT)	21	PAT-3181246
ROCKET PROPELLANT GRAINS	21	PAT-3177553
ROCKETS	19	PAT-3181466
ROTARY SEALS	21	PAT-3181509
ROTARY SWITCHES	09	PAT-3181038
SAFETY DEVICES	18	PAT-3181693
SAFETY HARNESS	01	PAT-3179360
SANITARY ENGINEERING	13	PB-167 552
SATELLITES (ARTIFICIAL)	22	PAT-3176933
	22	PB-167 600
SCIENTIFIC PERSONNEL	05	NCH-100 022
SCIENTIFIC RESEARCH	14	PB-167 330
	05	PB-167 445
	05	PB-167 446
	08	PB-167 570
SEALS (STOPPERS)	19	PAT-3174329
	21	PAT-3181509
SEATS	13	PAT-3179368
SEBACIC ACID	11	PAT-3180830
SEMICONDUCTING FILMS	09	AD-451 004
	10	PB-167 596
SEMICONDUCTOR DEVICES	09	AD-422 199
	09	AD-430 958
SEMICONDUCTORS	09	AD-289 235
	09	AD-422 199
	20	NCH-100 018
	07	PB-167 477
	22	PAT-3180264
SHAPED CHARGES	13	PAT-3179582
SHIP HULLS	13	PAT-3179368
SHOCK RESISTANCE	19	AD-433 000
SHOCK TUBES	19	AD-433 000
SHOCK WAVES	20	PB-167 607
	08	PB-167 502
SHORAN	09	AD-422 199
SILICON	20	PB-167 614
	13	PAT-3180670
SMALL TOOLS	05	PB-167 441
SOCIAL SCIENCES	05	PB-167 474
SOCIOLOGY	10	AD-401 872
SOLAR CELLS	10	PB-167 575
SOLAR RADIATION	21	PAT-3180770
SOLID ROCKET FUELS	19	PAT-3181138
SOUND	22	PB-167 616
SPACE COMMUNICATION SYSTEMS	22	PB-167 616
SPACE NAVIGATION	22	PB-167 616
SPACE STATIONS	22	PAT-3178883
SPACECRAFT	22	PAT-3180587
	05	PB-167 576
SPEECH	05	PB-167 576
SPEECH REPRESENTATION	17	PAT-3178714
STEREOSCOPIC DISPLAY SYSTEMS	12	PB-167 603
STOCHASTIC PROCESSES	10	AD-290 326
STORAGE BATTERIES	06	AD-436 809
STRESS (PSYCHOLOGY)	11	PAT-3180742
STRUCTURAL PARTS	05	AD-299 236
SUBJECT INDEXING	05	PB-167 308
	05	PB-167 309
	05	PB-167 444
	05	PB-167 447
SUBMARINES	17	PAT-3180295
	17	PAT-3182283
SUPPORTS	13	PAT-3179731
SURVEYING	08	PB-167 503
	17	PB-167 504
	08	PB-167 536
	08	PB-167 568
SURVIVAL	06	PB-167 402
SWITCHING CIRCUITS	09	PB-167 589
SYMPOSIA	22	PB-167 616
SYNCHROCYCLOTRONS	18	PAT-3181653
TEMPERATURE CONTROL	09	AD-431 161
TEMPERATURE SENSITIVE ELEMENTS	09	AD-403 528
	09	AD-431 161
THERMAL BATTERIES	10	PB-167 292
THERMOCOUPLES	10	PB-167 596
THERMOELECTRICITY	10	PB-167 596
THIOPHOSPHATES	11	PAT-3182022
	11	PAT-3182023
THIRST	06	PB-167 402
TORPEDOES	17	PAT-3180296
TOW BARS	13	PAT-3181893
TOWING CABLES	13	PAT-3176646
TRAINING	05	AD-446 448
TRAJECTORIES	12	AD-409 554
TRANSFORMATIONS (MATHEMATICS)	12	PB-167 606
TRANSISTORS	09	AD-412 741
	09	AD-451 004
	09	PAT-3182115
TRANSPORT PROPERTIES	07	AD-291 420
TRAVELING WAVE TUBES	09	AD-441 184
TRAVELLING-WAVE TUBES	09	PAT-3182225
TURBINE BLADES	10	PAT-3181835
UNDERWATER ORDNANCE	19	PAT-3174329
UNDERWATER SOUND	17	PAT-3182283
UNDERWATER TELEPHONES	17	PAT-3181115
URBAN AREAS	13	PB-167 714
UREA	04	PB-167 561
VANADATES	11	PAT-3181929
VARIABLE CAPACITORS	09	PAT-3181045
VIBRATION	10	PAT-3181835
VIBRATION ISOLATORS	13	PAT-3179368
VIBRATORS (ELECTRICAL)	09	PB-167 610
VISCOELASTICITY	07	PB-167 479
VOCABULARY	05	AD-299 236
WAVEGUIDE SWITCHES	09	PAT-3178659
WELDING	13	PAT-3180021
WESTERN EUROPE	05	PB-167 455

PERSONAL AUTHOR INDEX

The fields indicated here apply only to the other Research Reports and Related Material Section (on blue paper).

PERSONAL AUTHOR	FLD	ACCESS. NO.
ABOWITZ, G.	10	PB-167 596
ADAMS, T. E.	09	PAT-3181071
ADAMS, W. B.	09	PB-167 390
ALFIERO, J. M.	09	PB-167 618
ANDERSON, L. D.	19	PAT-3181138
ANDERSON, R. C.	13	PAT-3179731
ANDERSON, R. G.	11	PAT-3182024
ANSELONE, P. M.	12	PB-167 603
AOKI, E.	09	PB-167 610
ARCHIBALD, P. B.	21	PAT-3177552
ARMSTRONG, H. T.	22	PAT-3180264
ATHERTON, P.	05	PB-167 308
	05	PB-167 309
	05	PB-167 521
BABB, A. L.	07	AD-291 420
BAKER, O.	09	PB-167 610
BALLARD, W. E.	09	PAT-3182115
BANGERT, R. H.	09	AD-403 528
BARTLETT, J. H.	11	PAT-3183187
BATSCH, F. F.	22	PAT-3178883
BECK, A.	12	PB-167 609
BELLMAN, R.	12	AD-409 554
BENDITT, A.	01	PAT-3180082
BENNETT, D. G.	11	PAT-3180742
BENNETT, R. E.	09	PB-167 619
BERRY, L. A.	20	NCH-100 320
BIENSTOCK, D.	11	PAT-3181929
BLANCHARD, G. C.	21	AD-458 430
BOHL, W. H.	06	PB-167 525
	06	PB-167 526
BOURNE, C. P.	05	PB-167 377
	05	PB-167 378
BREEN, R. G. JR.	22	AD-454 469
BROEKE, A. T. T.	05	PB-167 492
BROOKS, B.	05	PB-167 447
BROWN, E. B.	08	PB-167 506
BRUNTIL, I. M.	09	PAT-3181045
BUCK, R. C.	12	PB-167 585
	12	PB-167 598
BUMP, G.	06	PB-167 523
	06	PB-167 526
BUMP, J. W.	06	PB-167 523
BUNT, E. A.	20	PAT-3182176
BUSACKER, R. G.	12	AD-296 365
BUSHOR, W. E.	05	PB-167 359
CALVERT, J. G.	07	PB-167 477
CARABILLO, V.	06	PB-167 442
CARNEY, S. M.	06	PB-167 524
CASH, B. A.	13	PAT-3179731
CHRISTENSEN, G. C.	06	PB-167 526
CHRISTIAN, J. W.	09	PB-167 635
CHRISTY, T. F.	09	PAT-3181071
CIECIERSKI, W.	09	AD-448 494
CLEMMONS, D. L. JR.	22	PAT-3176933
COBB, F. B.	11	PAT-3180829
COFFIN, S. A.	12	AD-296 365
COLBERT, L. O.	08	PB-167 503
CORDEA, J. N.	13	PAT-3180021
COWAN, R. E.	13	PAT-3180756
CROSSMAN, R. L.	01	PAT-3179360
CURTIS, D. L.	22	PB-167 393
CZAJKOWSKI, N.	19	PAT-3181466
DANTZIG, G. B.	12	AD-418 366
DAUT, F. X.	09	PAT-3182280
DAVIS, C. C.	10	PAT-3181835
DICK, L. A.	09	PB-167 619
DOWLER, W. L.	21	PAT-3180770
DRAGO, F.	09	AD-430 958
DRAIM, J. E.	16	PAT-3180225
	16	PAT-3181422
DRISKO, R. W.	11	PB-167 322
DUH, C. Y.	20	PB-167 614
DUTCH, P. H.	10	AD-290 326
EDWARDS, R. W.	09	PB-167 589
EISLER, F. G.	05	PB-167 576
ELLINGSON, H. E.	17	PAT-3182283
ELY, R. E.	11	PB-167 557
EMMONS, C. H.	10	PB-167 292
EVANS, L. W.	08	PB-167 535
EVANS, R. M.	13	PAT-3180021
EVERETT, G. H.	08	PB-167 535
FARLEY, E.	05	PB-167 441
FAVRE, M.	09	PAT-3182225
FELDHAKE, L. E.	09	PAT-3181038
FELTS, R.	17	PAT-3178714
FERRY, J. D.	07	PB-167 479
FEUERSANGER, A. E.	09	PB-167 487
FIACCO, A. V.	12	PB-167 599
FIELD, J. H.	11	PAT-3181929
FIELDS, E. J.	11	PAT-3181964
FINUCANE, J. H.	08	PB-167 261
FISH, G. R.	08	PB-167 502
FLERI, D.	09	AD-430 958
FORSLIND, E.	07	AD-420 477
FRENCH, J. C.	20	NCH-100 018
FRESEMAN, W. L.	09	PAT-3181076
FULTON, J.	09	PB-167 610
GARNER, H. D.	22	PAT-3180587
GARNER, J. D.	01	PB-167 551
GEORGEVICH, D.	19	AD-450 567
GEYGER, W. A.	09	PAT-3177447
GLAZE, T. C.	13	PAT-3181844
GOLDFELD, S. M.	12	PB-167 517
GOMERY, T. D.	05	PB-167 513
GOODMAN, A. M.	09	AD-289 205
GORDON, D. A.	21	PAT-3180770
GOUCHER, C. R.	21	AD-458 430
GOWEN, P. J.	12	AD-296 365
GREEN, C. E.	09	PAT-3182284
GREEN, R. J.	09	AD-431 161
GREENSPAN, H. J.	22	PB-167 393
GROSS, S.	08	PAT-3178736
GRUBER, B. A.	10	AD-439 994
GUILDNER, L. A.	13	PAT-3177017
GULICK, J. F. JR.	17	PAT-3181813
GUTHART, H.	19	AD-433 000
HAALAND, C. M.	20	AD-436 431
HAGENLOCHER, A. K.	09	PB-167 487
HAMILTON, W. H.	17	PAT-3180296
HANNEMAN, W. W.	11	PAT-3178368
HANSEN, H. A.	06	PB-167 527
HANSON, E. L.	09	PAT-3179942
HARRISON, R.	09	AD-430 958
HESSON, J. C.	18	PAT-3181700
HILLMAN, D. J.	05	PB-167 444
HIRSCH, A. E.	06	AD-436 809
	13	PAT-3179368
HOLMSTROM, F. M.	15	PB-167 553
HOUSEHOLDER, A. S.	12	PB-167 606
HOWELLS, P. W.	09	PB-167 390
INGRAHAM, W. J. JR.	08	PB-167 260
JACOT, T. D.	17	PAT-3181813
JASTER, J. J.	05	AD-299 236
JENKINS, L. W.	21	PAT-3181246
JENKINS, W. H.	09	PB-167 636
JOHLER, J. R.	20	NCH-100 020
JOHNSTON, W. H.	18	AD-285 564
JONES, E. M. T.	09	AD-402 852
JOPSON, H. B.	13	PAT-3181893
KANE, W.	09	AD-451 004
KANWAL, R. P.	20	PB-167 607
KARNOW, P.	13	PAT-3181893
KARO, H. A.	17	PB-167 504
	08	PB-167 541
KAUFFMAN, S. H.	19	PAT-3174329
KEENAN, S.	05	PB-167 521
KELLY, J. A. JR.	08	PB-167 261
KERSHAW, J. A.	05	PB-167 638
KILGOUR, F. G.	05	PB-167 447
KING, J. I. F.	04	PB-167 548
KLASS, D. L.	11	PAT-3180827
KLINTS, V.	15	PB-167 596
KLUGE, H. O.	11	PAT-3182022
KNAPP, H. H. JR.	17	PAT-3181813
KNOLLENBERG, R. G.	04	PB-167 561
KOLB, C. R.	15	PB-167 553
KOON, W. S.	06	PAT-201010
KOPAL, Z.	22	PB-167 600
KOSLOW, R. H.	06	PAT-3179581
KOUBEK, F. J.	11	PAT-3179531
KRAMER, B. E.	11	PAT-3181964
KRAUSE, M.	18	AD-285 564
LAMPE, F. W.	18	AD-285 564
LANCASTER, E.	10	PB-167 596
LAUB, J.	22	PAT-3178883
LAUER, G.	10	AD-290 326
LEACH, L. L. JR.	11	PAT-3180829
LEESE, J. A.	04	PB-167 549
LEFORT, M. G.	11	PAT-3180742
LEHMANN, W. P.	05	PB-167 491
	05	PB-167 567
LENSINK, C. J.	06	PB-167 529
LETHBRIDGE, M. D.	04	PB-167 511
LEWIN, S. Z.	06	PAT-3179581
LIOU, M. L.	09	PB-167 591
LIPPINCOTT, S. B.	11	PAT-3183187
LITZ, C. J. JR.	06	PB-167 326
LOCHHEAD, J. L.	19	PAT-3180226
LOWRIE, R.	11	AD-285 313
	11	AD-400 299
	11	AD-409 923
LU, P. C.	20	PB-167 566
LUBELL, H.	05	PB-167 455
LUCHSINGER, E. B.	10	AD-290 326
LUHN, H. P.	05	PB-167 376
	05	PB-167 440
LUKE, G. W. JR.	09	PAT-3178659
MAGNUSON, R. A.	19	PAT-3181427
MANN, H. B.	12	PB-167 582
MARASCO, P. M.	20	PAT-3180208
MARTIN, F. W.	06	PB-167 528
MARTINEK, T. W.	11	PAT-3180827
MARVIN, K. T.	08	PB-167 259
MATTHAEI, G. L.	09	AD-402 852
MAYO, B. R.	09	PB-167 390
MCCORMICK, G. P.	12	PB-167 599
MCFADDEN, E. B.	01	PB-167 551
MCKEAN, R. N.	05	PB-167 638
MCKENZIE, D.	09	PB-167 610
MCKISSON, R. L.	10	AD-290 326
MEADE, B. K.	08	PB-167 563
MEHL, W. W.	09	AD-289 205
MENDOZA, R.	05	PB-167 576
MENGES, G.	12	PB-167 516
MILLS, G. J.	21	PAT-3180770
MILROY, W. E.	17	PAT-3181139
MITCHELL, F. R.	22	PAT-3178883
MITCHELL, H. C.	08	PB-167 568
MOHLER, S. R.	01	PB-167 551
MOLL, J. L.	20	PB-167 614
MOORE, L. C.	17	PB-167 547
MORAN, S. F.	09	PAT-3182115
MORGENSTERN, O.	05	PB-167 474
MORITA, T.	19	AD-433 000
MORSE, G. A. JR.	14	PAT-3179350
MOUNTVALA, A.	10	PB-167 596
MOY, T. K.	16	PAT-3180222
MUNSON, J. C.	17	PAT-3182283
MUSSELMAN, N. P.	06	PAT-201010
NALL, H. H.	17	PAT-3181813
NATWICK, J. O.	13	PAT-3176646
NELKIN, A.	17	PAT-3180296
NELSON, W. D.	09	PB-167 390
NICHOLS, D. A.	13	PAT-3176646
NIDA, P. M.	17	PB-167 547
NIEDERER, O. C.	17	PAT-3180295
ODELL, N. R.	11	PAT-3180830
	11	PAT-3180831
	11	PAT-3182022
OLSEN, H. L.	20	PAT-3182176
OSTERYOUNG, R. A.	10	AD-290 326
OSTROWSKI, A. M.	12	PB-167 604
PAK, K. S.	04	PB-167 511
PANOFSKY, H. A.	04	PB-167 511
PENDERGRAFT, E. D.	05	PB-167 491
	05	PB-167 567
PENNDORF, R.	04	PB-167 545
	04	PB-167 590
PHILLIPS, R. C.	08	PB-167 522
PLEMICH, J. J.	11	PAT-3182023
PONTARELLI, D. A.	14	AD-434 382
PORCELLI, P.	12	PB-167 583
POUST, L. N.	13	PAT-3179962
PRATT, T. H.	21	PAT-3181246
PREISER, H. S.	13	PAT-3179582
PROCTOR, R. R. JR.	08	PB-167 259
PRYDE, T. R.	13	PAT-3180670
QUANDT, R. E.	12	PB-167 517
RADKE, C. E.	09	PB-167 515
REID, H. J. E. JR.	22	PAT-3180587
REYNOLDS, M. M.	05	PB-167 520
RIEPPEL, P. J.	13	PAT-3180021
ROCHA, J. G.	19	PAT-3181423
ROMAGNOLI, R. J.	10	AD-401 872
ROSKELLEY, J. A.	18	PAT-3181653
ROTOLO, L. S.	05	PB-167 513
RUSCH, A.	14	PAT-3179533
SABLE, J. D.	05	PB-167 305
SALOMAN, C. H.	08	PB-167 261
SAUNDERS, R. A.	14	PB-167 330
SCARLETT, R. M.	09	AD-412 741
SCHLEGEL, W. R.	01	PAT-3170358
SCHNABLE, G.	09	AD-422 199
SCHNEIDER, C.	09	PB-167 618
SCILLIAN, G.	10	PB-167 292
SHAPIRO, J. M.	09	PAT-3181045
SHEAR, J. C.	13	PAT-3179962
SHELTON, S. W.	01	PAT-3179360
SHOEMAKER, H. E.	18	PAT-3179722
SIEGART, W. R.	11	PAT-3180830
	11	PAT-3182022
SIMON, L. B.	21	PAT-3181509
SMATHERS, S. E.	08	PB-167 499
SMITH, J. V.	09	PAT-3178659
SMITH, R. A.	09	PAT-3181071
SNYDER, J. A.	11	PAT-3180829
SPRIGGS, R. M.	11	PAT-3180742
STEDMAN, R. L.	02	PAT-3180340
STEEL, R. G. D.	12	PB-167 602
STEPHENS, F. H. JR.	09	PAT-3181076
STERRETT, C. S.	01	PAT-3180082
STILLS, C. D.	02	PAT-3180340
STIMSON, H. F.	13	PAT-3177017
STUART, F. A.	11	PAT-3182024
SWARTZ, M. D.	20	PAT-3180208
SWEARINGEN, J. J.	01	PB-167 551
SWINBURN, C.	05	PB-167 449
TAUDVIN, P. C.	09	AD-431 161
TAYLOR, J. W. JR.	17	PAT-3177485
TAYLOR, R. S.	05	PB-167 519
TAYLOR, W. V. JR.	11	PAT-3180830

PERSONAL AUTHOR	FLD	ACCESS. NO.
TEN BROEKE, A. T.	05	PB-167 449
THOLEY, F. E. J.	17	PAT-3181152
THOMPSON, M. S.	05	PB-167 513
THORNE, J. P.	05	PB-167 358
TICHY, J. R.	07	PB-167 577
TROTTER, H. F.	12	PB-167 517
TRUPP, R. D.	14	PAT-3176800
VARON, J.	10	PB-167 596
VENN, D. A.	14	PB-167 330
VESTAL, M.	18	AD-285 564
VIENNA, P. C.	11	PAT-3182023
VOGEL, F. D.	19	PAT-3174329
VOGLER, L. E.	17	NCH-100 019
VOLKHOLZ, K. L.	09	AD-450 300
WAHRHAFTIG, A. L.	18	AD-285 564
WAINWRIGHT, W. N.	17	PAT-3181115
WALKER, S. H.	15	PB-167 601
WASOW, W.	20	PB-167 605
WEAVER, V.	05	PB-167 309
WHITTEN, C. A.	08	PB-167 506
	08	PB-167 536
WHITTEN, F. I.	13	PAT-3179368
WIGHTMAN, M.	05	PB-167 449
WILLIAMS, D. L.	10	AD-439 994
WILSON, J. B.	05	PB-167 513
WISOTSKY, M. J.	11	PAT-3180831
WORK, R. O.	09	PAT-3182280
YENTZER, H. V.	13	PAT-3181893
YOUNG, L.	09	AD-402 852
ZUCKER, J.	09	AD-430 958
ZUSMAN, F. S.	05	PB-167 513

CORPORATE SOURCE INDEX

The fields indicated here apply only to the other Research Reports and Related Material Section (on blue paper).

CORPORATE SOURCE	FLD	ACCESS. NO.
AERONAUTICAL CHART AND INFORMATION CENTER, ST. LOUIS, MO.	08	PB-167 540
AEROSPACE CORP., LOS ANGELES, CALIF.	22	PB-167 616
AMERICAN INST. OF PHYSICS, NEW YORK.	05	PB-167 308
	05	PB-167 309
	05	PB-167 521
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC., WASHINGTON, D. C.	05	PB-167 445
	05	PB-167 446
AMMUNITION ENGINEERING DIRECTORATE, PICATINNY ARSENAL, DOVER, N. J.	19	AD-450 567
ARCTIC AEROMEDICAL LAB., FORT WAINWRIGHT, ALASKA.	15	PB-167 553
ARMY MISSILE COMMAND, REDSTONE ARSENAL, ALA.	11	PB-167 557
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.	10	AD-290 326
AUERBACH CORP., PHILADELPHIA, PA.	05	PB-167 305
BELL TELEPHONE LABS., INC., NEW YORK.	09	PB-167 618
BENDIX CORP., DAVENPORT, IOWA. PIONEER-CENTRAL DIV.	09	AD-403 528
BUNKER-RAMO CORP., CANOGA PARK, CALIF.	05	PB-167 558
	05	PB-167 559
BUREAU OF COMMERCIAL FISHERIES, GALVESTON, TEX.	08	PB-167 259
	08	PB-167 260
	08	PB-167 261
BUREAU OF SPORT FISHERIES AND WILD LIFE, WASHINGTON, D. C.	08	PB-167 522
	06	PB-167 523
	06	PB-167 524
	06	PB-167 525
	06	PB-167 526
	06	PB-167 527
	06	PB-167 528
	06	PB-167 529
CASE INST. OF TECH., CLEVELAND, OHIO.	20	PB-167 566
CENTER FOR THE INFORMATION SCIENCES, LEHIGH UNIV., BETHLEHEM, PA.	05	PB-167 444
	05	PB-167 519
CIVIL AEROMEDICAL RESEARCH INST., OKLAHOMA CITY, OKLA.	01	PB-167 551
CLOUD PHYSICS LAB., UNIV. OF CHICAGO, ILL.	04	PB-167 561
COAST AND GEODETIC SURVEY, WASHINGTON, D. C.	08	PB-167 499
	08	PB-167 502
	08	PB-167 503
	17	PB-167 504
	08	PB-167 506
	08	PB-167 530
	08	PB-167 535
	08	PB-167 536
	08	PB-167 540
	08	PB-167 541
	08	PB-167 563
	08	PB-167 568
	08	PB-167 570
CORNING GLASS WORKS, N. Y.	09	PB-167 636
DATATROL CORP., SILVER SPRING, MD.	05	AD-299 236
DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. J.	09	AD-289 205
DAVID TAYLOR MODEL BASIN, WASHINGTON, D. C.	06	AD-436 809
DEFENSE SUBSISTENCE AND SUPPLY CENTER, CHICAGO, ILL.	06	PB-167 402
ELECTRON PHYSICS LAB., UNIV. OF MICHIGAN, ANN ARBOR.	09	AD-450 300
EUGENE H. DRAKE MEMORIAL LAB., PORTLAND, MAINE.	07	PB-167 577
FEDERAL AVIATION AGENCY, INDIANAPOLIS, IND., TECHNICAL DEVELOPMENT CENTER.	17	PB-167 547
FRANKFORD ARSENAL, PHILADELPHIA, PA. RESEARCH AND DEVELOPMENT DIRECTORATE.	06	PB-167 326
GENERAL ELECTRIC CO., SYRACUSE, N. Y. HEAVY MILITARY ELECTRONICS DEPT.	09	PB-167 390
GENERAL TELEPHONE AND ELECTRONICS LABS., INC., BAYSIDE, N. Y.	09	AD-430 958
	09	PB-167 487
GEOPHYSICS CORP. OF AMERICA, BEDFORD, MASS.	04	PB-167 548
HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP., BROAD BROOK, CONN.	09	AD-431 161
HARRY DIAMOND LABS., WASHINGTON, D. C.	10	PB-167 292
HUMAN RESOURCES RESEARCH OFFICE, GEORGE WASHINGTON UNIV., ALEXANDRIA, VA.	05	AD-446 448
IBM ADVANCED SYSTEMS DEVELOPMENT DIV., YORKTOWN HEIGHTS, N. Y.	05	PB-167 376
IBM RESEARCH CENTER, YORKTOWN HEIGHTS, N. Y.	05	PB-167 440
IIT RESEARCH INST., CHICAGO, ILL.	14	AD-434 382
	20	AD-436 431
INDIANA UNIV., BLOOMINGTON. LINGUISTICS RESEARCH GROUP.	05	PB-167 358
JOHNSTON (WILLIAM H.) LABS., INC., BALTIMORE, MD.	18	AD-285 564
KANSAS UNIV., LAWRENCE.	05	PB-167 441
KNIGHTS (JAMES) CO., SANDWICH, ILL.	09	PB-167 619
LANSDALE DIV., PHILCO CORP., PA.	09	AD-422 199
LIBRARY OF CONGRESS, WASHINGTON, D. C.	05	PB-167 513
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.	09	AD-441 184
LINGUISTICS RESEARCH CENTER, UNIV. OF TEXAS, AUSTIN.	05	PB-167 449
	05	PB-167 491
	05	PB-167 492
	05	PB-167 567
LITTON SYSTEMS, INC., BEVERLY HILLS, CALIF.	22	PB-167 393
MATHEMATICS RESEARCH CENTER, UNIV. OF WISCONSIN, MADISON.	12	PB-167 582
	12	PB-167 583
	12	PB-167 585
	12	PB-167 598
	22	PB-167 600
	12	PB-167 602
	12	PB-167 603
	12	PB-167 604
	20	PB-167 605
	12	PB-167 606
	20	PB-167 607
	12	PB-167 609
MATERIALS RESEARCH CORP., ORANGEBURG, N. Y.	10	PB-167 596
MCGRAW-HILL, INC., NEW YORK.	05	PB-167 359
MELPAR, INC., FALLS CHURCH, VA.	21	AD-458 430
MICHIGAN UNIV., ANN ARBOR. COLL. OF ENGINEERING.	04	PB-167 549
MICROWAVE ASSOCIATES, INC., BURLINGTON, MASS.	09	PB-167 635
MONSANTO RESEARCH CORP., EVERETT, MASS.	10	AD-439 994
NATIONAL BIOMEDICAL RESEARCH FOUNDATION, SILVER SPRING, MD.	05	PB-167 513
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.	20	NCH-100 018
	17	NCH-100 019
	20	NCH-100 020
NATIONAL CAPITAL TRANSPORTATION AGENCY, WASHINGTON, D. C.	13	PB-167 714
NATIONAL SCIENCE FOUNDATION, WASHINGTON, D. C.	05	NCH-100 022
NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF.	11	PB-167 322
NAVAL OCEANOGRAPHIC OFFICE, WASHINGTON, D. C.	08	PB-167 564
NAVAL RESEARCH LAB., WASHINGTON, D. C.	14	PB-167 330
OHIO STATE UNIV. RESEARCH FOUNDATION, COLUMBUS.	07	PB-167 477
PARMA RESEARCH CENTER, CLEVELAND, OHIO	11	AD-400 299
	11	AD-409 923
PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.	04	PB-167 511
PHILCO CORP., BLUE BELL, PA.	09	AD-451 004
PHYSICAL STUDIES, INC., KETTERING, OHIO.	22	AD-454 469
PRINCETON UNIV., N. J.	12	PB-167 516
	12	PB-167 517
RAND CORP., SANTA MONICA, CALIF.	12	AD-409 554
	12	AD-418 366
	05	PB-167 455
	05	PB-167 474
	05	PB-167 638
RESEARCH ANALYSIS CORP., MCLEAN, VA.	12	AD-296 365
	12	PB-167 599
	15	PB-167 601
RESEARCH AND ADVANCED DEVELOPMENT DIV., AVCO CORP., WILMINGTON, MASS.	04	PB-167 545
RESEARCH AND ADVANCED DEVELOPMENT DIV., AVCO CORP., WILMINGTON, MASS.	04	PB-167 590
ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO.	13	PB-167 552
ROYAL INST. OF TECH., STOCKHOLM (SWEDEN).	07	AD-420 477
SEATTLE PACIFIC COLL., WASH. DEPT. OF BOTANY.	08	PB-167 522
SHOCKLEY LAB., CLEVITE CORP., PALO ALTO, CALIF.	09	AD-412 741
SIGNETICS CORP., SUNNYVALE, CALIF.	09	PB-167 610
SPECTROLAB, NORTH HOLLYWOOD, CALIF.	10	AD-401 872
STANFORD ELECTRONICS LABS., STANFORD UNIV., CALIF.	09	PB-167 589
	09	PB-167 591
	20	PB-167 614
STANFORD RESEARCH INST., MENLO PARK, CALIF.	09	AD-402 852
	19	AD-433 000
	05	PB-167 377
	05	PB-167 378
STELMA, INC., STAMFORD, CONN.	09	AD-448 494
SYSTEM DEVELOPMENT CORP., SANTA MONICA, CALIF.	06	PB-167 442
SYSTEMS RESEARCH CENTER, CASE INST. OF TECH., CLEVELAND, OHIO.	09	PB-167 515
UNION CARBIDE RESEARCH INST., TARRYTOWN, N. Y.	11	AD-285 313
	11	AD-400 299
	11	AD-409 923
UNIVERSITY COLL., LONDON (ENGLAND).	05	PB-167 576
WASHINGTON UNIV., SEATTLE. COLL. OF ENGINEERING.	07	AD-291 420
WEST VIRGINIA UNIV., MORGANTOWN. LIBRARY.	05	PB-167 520
WISCONSIN UNIV., MADISON.	07	PB-167 479
YALE UNIV., NEW HAVEN, CONN. MEDICAL LIBRARY.	05	PB-167 447

CONTRACT NUMBER INDEX

The fields indicated here apply only to the other Research Reports and Related Material Section (on blue paper).

CONTRACT NUMBER	FLD	ACCESS. NO.
CONTRACT AF19 604 6644	07	PB-167 477
CONTRACT AF19 628 2426	22	AD-454 469
CONTRACT AF19 628 500	09	AD-441 184
CONTRACT AF30 602 2323	09	PB-167 390
CONTRACT AF33 616 7678	18	AD-285 564
CONTRACT AF33 616 8166	22	PB-167 393
CONTRACT AF33 657 9186	21	AD-458 430
CONTRACT AF49 638 700	12	AD-409 554
	12	AD-418 366
CONTRACT CWB10564	04	PB-167 549
CONTRACT CWB10795	04	PB-167 549
CONTRACT CWB10883	04	PB-167 548
CONTRACT DA04 2000RD999	07	AD-291 420
CONTRACT DA11 022ORD2059	12	PB-167 582
	12	PB-167 583
	12	PB-167 585
	12	PB-167 598
	22	PB-167 600
	12	PB-167 602
	12	PB-167 603
	12	PB-167 604
	20	PB-167 605
	12	PB-167 606
	20	PB-167 607
	12	PB-167 609
CONTRACT DA11 022ORD3336	07	PB-167 479
CONTRACT DA30 069ORD2787	11	AD-285 313
	11	AD-400 299
	11	AD-409 923

CONTRACT NUMBER	FLD	ACCESS. NO.
CONTRACT DA36 034ORD3283RD	09	AD-289 205
CONTRACT DA36 039AMC00027E	09	AD-450 300
CONTRACT DA36 039AMC02172E	09	AD-431 161
CONTRACT DA36 039AMC02284E	09	AD-430 958
CONTRACT DA36 039AMC02373E	09	AD-451 094
CONTRACT DA36 039AMC03186E	09	AD-448 494
CONTRACT DA36 039AMC03230E	09	PB-167 635
CONTRACT DA36 039AMC03269E	09	PB-167 610
CONTRACT DA36 039SC85339	20	PB-167 614
CONTRACT DA36 039SC87234	09	PB-167 618
CONTRACT DA36 039SC87302	09	PB-167 487
CONTRACT DA36 039SC87336	10	AD-439 994
CONTRACT DA36 039SC87398	09	AD-402 852
CONTRACT DA36 039SC87449	10	AD-401 872
CONTRACT DA36 039SC88925	10	AD-290 326
CONTRACT DA36 039SC88927	14	AD-434 382
CONTRACT DA36 039SC89070	09	AD-422 199
CONTRACT DA36 039SC891C1	09	PB-167 636
CONTRACT DA36 039SC89268	09	PB-167 619
CONTRACT DA36 039SC90762	20	AD-436 431
CONTRACT DA36 039SC90782	09	AD-403 528
CONTRACT DA36 039SC90837	09	AD-412 741
CONTRACT DA44 188AR01	12	AD-296 365
CONTRACT DA44 188AR01	12	PB-167 599
CONTRACT DA44 188AR01	15	PB-167 601
CONTRACT DA44 188AR02	05	AD-446 448
CONTRACT DA91 591EUC2364	07	AD-420 477
CONTRACT N0B588212	10	PB-167 596

CONTRACT NUMBER	FLD	ACCESS. NO.
CONTRACT NSF C255	04	PB-167 545
	04	PB-167 590
CONTRACT NSF C372	05	PB-167 558
	05	PB-167 559
CONTRACT NSF C295	05	AD-299 236
CONTRACT NSF GN281	05	PB-167 445
CONTRACT SD103	19	AD-433 000
CONTRACT 3A99 21 003	09	AD-451 004
GRANT DA AKO D31 124G107	07	AD-291 420
GRANT DA ARO D31 124G110	07	PB-167 479
GRANT NIH H5380	07	PB-167 577
GRANT NSF GE2569	05	PB-167 519
GRANT NSF GN177	05	PB-167 444
GRANT NSF GN281	05	PB-167 446
GRANT NSF GN308	05	PB-167 449
	05	PB-167 491
	05	PB-167 492
GRANT NSF GN54	05	PB-167 567
GRANT NSF GP2122	09	PB-167 515
GRANT NSF GP520	09	PB-167 591
GRANT NSF GP658	09	PB-167 515
GRANT NSF G18100	05	PB-167 513
GRANT NSF G18494	05	PB-167 445
	05	PB-167 446
GRANT NSF G19000	20	PB-167 566
GRANT NSF G19277	05	PB-167 567
GRANT NSF G22419	04	PB-167 561
GRANT PHS MH05201 02	05	PB-167 576
GRANT WBG14	04	PB-167 511

ACCESSION / REPORT NUMBER INDEX

The fields indicated here apply only to the other Research Reports and Related Material Section (on blue paper).

ACCESSION/REPORT NO.	FLD	ACCESS. NO.
AAL TDR-64-28	15	PB-167 553
AD-099 651	06	PB-167 402
AD-147 632	12	PB-167 606
AD-147 633	20	PB-167 605
AD-160 673	20	PB-167 607
AD-207 239	12	PB-167 583
AD-207 998	12	PB-167 602
AD-207 999	12	PB-167 598
AD-208 000	22	PB-167 600
AD-208 051	12	PB-167 585
AD-208 055	12	PB-167 582
AD-212 055	12	PB-167 603
AD-218 615	12	PB-167 609
AD-219 781	05	PB-167 455
AD-248 592	09	PB-167 390
AD-285 313	11	AD-285 313
AD-285 564	18	AD-285 564
AD-289 205	09	AD-289 205
AD-290 326	10	AD-290 326
AD-291 420	07	AD-291 420
AD-295 735	15	PB-167 601
AD-296 365	12	AD-296 365
AD-299 236	05	AD-299 236
AD-400 299	11	AD-400 299
AD-401 872	10	AD-401 872
AD-402 606	22	PB-167 393
AD-402 852	09	AD-402 852
AD-403 528	09	AD-403 528
AD-409 554	12	AD-409 554
AD-409 923	11	AD-409 923
AD-412 741	09	AD-412 741
AD-416 728	09	PB-167 487
AD-418 366	12	AD-418 366
AD-418 672	10	PB-167 596
AD-420 477	07	AD-420 477
AD-422 199	09	AD-422 199
AD-425 156	07	PB-167 479
AD-429 145	09	PB-167 636
AD-430 868	09	PB-167 635
AD-430 958	09	AD-430 958
AD-431 161	09	AD-431 161
AD-433 000	19	AD-433 000
AD-433 781	20	PB-167 614
AD-434 382	14	AD-434 382
AD-434 789	07	PB-167 477
AD-436 431	20	AD-436 431
AD-436 809	06	AD-436 809
AD-437 147	09	PB-167 610
AD-437 822	09	PB-167 619
AD-438 525	09	PB-167 618
AD-439 994	10	AD-439 994
AD-441 184	09	AD-441 184
AD-442 963	06	PB-167 326
AD-444 775	11	PB-167 557
AD-446 448	05	AD-446 448
AD-448 494	09	AD-448 494
AD-450 300	09	AD-450 300
AD-450 546	12	PB-167 599
AD-450 567	19	AD-450 567
AD-451 004	09	AD-451 004
AD-453 500	22	PB-167 616
AD-454 070	10	PB-167 292
AD-454 469	22	AD-454 469
AD-457 733	15	PB-167 553
AD-458 430	21	AD-458 430
AD-459 638	01	PB-167 551
AFCRL-64-120	07	PB-167 477
AFCRL-64-691 PA	22	AD-454 469
AI-7823	10	AD-290 326
AIP/DRP-64-2	05	PB-167 308
AIP/DRP-64-3	05	PB-167 309
AIP/DRP-65-2	05	PB-167 521
AM-65-7	01	PB-167 551
APA-PSIEP-12	05	PB-167 445
APA-PSIEP-13	05	PB-167 446
ARDD-2380 5	07	AD-291 420
ARDD-2589 8	07	PB-167 479
ARDD-2838 1	09	AD-289 205
ASD-TDR-62-10 P2	18	AD-285 564
ASD-TDR-62-661	22	PB-167 393
ATI-210 734	05	PB-167 474
ESD-TDR-64-423	09	AD-441 184
ERP-RM-71	12	PB-167 516
ERP-RM-72	12	PB-167 517
FWS-DR2	08	PB-167 259
FWS-DR3	08	PB-167 260
FWS-DR4	08	PB-167 261
GCA-TR-65-6-G	04	PB-167 548
HSER-2696	09	AD-431 161
IITRI-A1203-22	14	AD-434 382
IITRI-T218-13	20	AD-436 431
IR-3	05	AD-299 236
LRC-62-WAA1	05	PB-167 567
LRC-64-TS-2	05	PB-167 449
LRC-65-NSF-23	05	PB-167 491
LRC-65-TS-3	05	PB-167 492
M 85	17	NCH-100 019
MR84006Q10	10	AD-439 994
MRC-TSR-12	20	PB-167 607
MRC-TSR-2	20	PB-167 605
MRC-TSR-219	12	PB-167 604
MRC-TSR-3	12	PB-167 606
MRC-TSR-39	12	PB-167 583
MRC-TSR-40	12	PB-167 582
MRC-TSR-48	12	PB-167 585
MRC-TSR-51	12	PB-167 598
MRC-TSR-52	22	PB-167 600
MRC-TSR-56	12	PB-167 602
MRC-TSR-59	12	PB-167 603
MRC-TSR-90	12	PB-167 609
MRC-389	10	PB-167 596
M64-31-1	06	PB-167 326
NBR-62071/18100	05	PB-167 513
NBS-M 78	20	NCH-100 020
NCH-100 018	20	NCH-100 018
NCH-100 019	17	NCH-100 019
NCH-100 020	20	NCH-100 020
NCH-100 022	05	NCH-100 022
NSF-64-16	05	NCH-100 022
N64-13093	12	AD-418 366
N64-26827	06	PB-167 326
N64-29303	11	PB-167 557
PAL-65-1	10	PB-167 575
PATENT DESIGN-201010	06	PAT-201010
PATENT-3170358	01	PAT-3170358
PATENT-3174329	19	PAT-3174329
PATENT-3176646	13	PAT-3176646
PATENT-3176800	14	PAT-3176800
PATENT-3176933	22	PAT-3176933
PATENT-3177017	13	PAT-3177017
PATENT-3177447	09	PAT-3177447
PATENT-3177485	17	PAT-3177485
PATENT-3177553	21	PAT-3177553
PATENT-3178368	11	PAT-3178368
PATENT-3178659	09	PAT-3178659
PATENT-3178714	17	PAT-3178714
PATENT-3178736	08	PAT-3178736
PATENT-3178883	22	PAT-3178883
PATENT-3179350	14	PAT-3179350
PATENT-3179360	01	PAT-3179360
PATENT-3179368	13	PAT-3179368
PATENT-3179531	11	PAT-3179531
PATENT-3179533	14	PAT-3179533
PATENT-3179581	06	PAT-3179581
PATENT-3179582	13	PAT-3179582
PATENT-3179722	18	PAT-3179722
PATENT-3179731	13	PAT-3179731
PATENT-3179942	09	PAT-3179942
PATENT-3179962	13	PAT-3179962
PATENT-3180021	13	PAT-3180021
PATENT-3180082	01	PAT-3180082
PATENT-3180208	20	PAT-3180208
PATENT-3180222	16	PAT-3180222
PATENT-3180225	16	PAT-3180225
PATENT-3180226	19	PAT-3180226
PATENT-3180264	22	PAT-3180264
PATENT-3180295	17	PAT-3180295
PATENT-3180296	17	PAT-3180296
PATENT-3180340	02	PAT-3180340
PATENT-3180587	22	PAT-3180587
PATENT-3180670	13	PAT-3180670
PATENT-3180742	11	PAT-3180742
PATENT-3180756	13	PAT-3180756
PATENT-3180770	21	PAT-3180770
PATENT-3180827	11	PAT-3180827
PATENT-3180829	11	PAT-3180829
PATENT-3180830	11	PAT-3180830
PATENT-3180831	11	PAT-3180831
PATENT-3181038	09	PAT-3181038
PATENT-3181045	09	PAT-3181045
PATENT-3181071	09	PAT-3181071
PATENT-3181076	09	PAT-3181076
PATENT-3181115	17	PAT-3181115
PATENT-3181138	19	PAT-3181138
PATENT-3181139	17	PAT-3181139
PATENT-3181152	17	PAT-3181152
PATENT-3181246	21	PAT-3181246
PATENT-3181422	16	PAT-3181422
PATENT-3181423	19	PAT-3181423
PATENT-3181427	19	PAT-3181427
PATENT-3181466	19	PAT-3181466
PATENT-3181509	21	PAT-3181509
PATENT-3181653	18	PAT-3181653
PATENT-3181700	18	PAT-3181700
PATENT-3181813	17	PAT-3181813
PATENT-3181835	10	PAT-3181835
PATENT-3181844	13	PAT-3181844
PATENT-3181893	13	PAT-3181893
PATENT-3181929	11	PAT-3181929
PATENT-3181964	11	PAT-3181964
PATENT-3182022	11	PAT-3182022
PATENT-3182023	11	PAT-3182023
PATENT-3182024	11	PAT-3182024
PATENT-3182115	09	PAT-3182115
PATENT-3182176	20	PAT-3182176
PATENT-3182225	09	PAT-3182225
PATENT-3182280	09	PAT-3182280
PATENT-3182283	17	PAT-3182283
PATENT-3182284	09	PAT-3182284
PATENT-3183187	11	PAT-3183187
PB-167 259	08	PB-167 259
PB-167 260	08	PB-167 260
PB-167 261	08	PB-167 261
PB-167 292	10	PB-167 292
PB-167 305	05	PB-167 305
PB-167 308	05	PB-167 308
PB-167 309	05	PB-167 309
PB-167 322	11	PB-167 322
PB-167 326	06	PB-167 326
PB-167 330	14	PB-167 330
PB-167 358	05	PB-167 358
PB-167 359	05	PB-167 359
PB-167 376	05	PB-167 376
PB-167 377	05	PB-167 377
PB-167 378	05	PB-167 378
PB-167 390	09	PB-167 390
PB-167 393	22	PB-167 393
PB-167 402	06	PB-167 402
PB-167 440	05	PB-167 440
PB-167 441	05	PB-167 441
PB-167 442	06	PB-167 442
PB-167 444	05	PB-167 444
PB-167 445	05	PB-167 445
PB-167 446	05	PB-167 446
PB-167 447	05	PB-167 447
PB-167 449	05	PB-167 449
PB-167 455	05	PB-167 455
PB-167 474	05	PB-167 474
PB-167 477	07	PB-167 477
PB-167 479	07	PB-167 479
PB-167 487	09	PB-167 487
PB-167 491	05	PB-167 491
PB-167 492	05	PB-167 492
PB-167 499	08	PB-167 499
PB-167 502	08	PB-167 502
PB-167 503	08	PB-167 503
PB-167 504	17	PB-167 504
PB-167 506	08	PB-167 506
PB-167 511	04	PB-167 511
PB-167 513	05	PB-167 513
PB-167 515	09	PB-167 515
PB-167 516	12	PB-167 516
PB-167 517	12	PB-167 517
PB-167 519	05	PB-167 519
PB-167 520	05	PB-167 520
PB-167 521	05	PB-167 521
PB-167 522	08	PB-167 522
PB-167 523	06	PB-167 523
PB-167 524	06	PB-167 524
PB-167 525	06	PB-167 525
PB-167 526	06	PB-167 526
PB-167 527	06	PB-167 527
PB-167 528	06	PB-167 528
PB-167 529	06	PB-167 529
PB-167 530	08	PB-167 530
PB-167 535	08	PB-167 535
PB-167 536	08	PB-167 536
PB-167 540	08	PB-167 540
PB-167 541	08	PB-167 541
PB-167 545	04	PB-167 545
PB-167 547	17	PB-167 547
PB-167 548	04	PB-167 548
PB-167 549	04	PB-167 549
PB-167 551	01	PB-167 551
PB-167 552	13	PB-167 552
PB-167 553	15	PB-167 553
PB-167 557	11	PB-167 557
PB-167 558	05	PB-167 558
PB-167 559	05	PB-167 559
PB-167 561	04	PB-167 561
PB-167 563	08	PB-167 563
PB-167 564	08	PB-167 564
PB-167 566	20	PB-167 566
PB-167 567	05	PB-167 567
PB-167 568	08	PB-167 568
PB-167 570	08	PB-167 570
PB-167 575	10	PB-167 575
PB-167 576	05	PB-167 576
PB-167 577	07	PB-167 577
PB-167 582	12	PB-167 582
PB-167 583	12	PB-167 583
PB-167 585	12	PB-167 585
PB-167 589	09	PB-167 589
PB-167 590	04	PB-167 590
PB-167 591	09	PB-167 591
PB-167 596	10	PB-167 596
PB-167 598	12	PB-167 598
PB-167 599	12	PB-167 599
PB-167 600	22	PB-167 600
PB-167 601	15	PB-167 601
PB-167 602	12	PB-167 602

ACCESSION/REPORT NO.	FLD	ACCESS. NO.
PB-167 603	12	PB-167 603
PB-167 604	12	PB-167 604
PB-167 605	20	PB-167 605
PB-167 606	12	PB-167 606
PB-167 607	20	PB-167 607
PB-167 609	12	PB-167 609
PB-167 610	09	PB-167 610
PB-167 614	20	PB-167 614
PB-167 616	22	PB-167 616
PB-167 618	09	PB-167 618
PB-167 619	09	PB-167 619
PB-167 635	09	PB-167 635
PB-167 636	09	PB-167 636
PB-167 638	05	PB-167 638
PB-167 714	13	PB-167 714
R-2	05	PB-167 444
R-323	11	PB-167 322
R-366-PR	12	AD-418 366
R-396-PR	12	AD-409 554
RAC-SP-183	12	AD-296 365
RAC-SP-187	15	PB-167 601
RAC-TP-123	12	PB-167 599
RADC-TN-60-259	09	PB-167 390
RAD-TR-65-1	04	PB-167 545
RAD-TR-65-2	04	PB-167 590
RC-59	05	PB-167 440
RM-2385	05	PB-167 455
RM-2473-FF	05	PB-167 638
RM-734	05	PB-167 474
RR-TR-64-11	11	PB-167 557
SR-1	22	AD-454 489
SEC-TR-A62-5	13	PB-167 552
SEL-63-029	09	PB-167 589
SEL-63-095	09	PB-167 591
SEL-64-009	20	PB-167 614
SR-21	04	PB-167 590
SRC-48-A-64-16	09	PB-167 515
TM-1326	19	AD-450 567
TN-232	20	NCH-100 018
TN-29	04	PB-167 561
TR-1176	10	PB-167 292
TR-118	08	PB-167 564
TR-16	19	AD-433 000
TR-2205-1	09	PB-167 589
TR-63-103.2	09	AD-430 958
TR-63-5.8G	09	PB-167 487
TR-6554-6	09	PB-167 591
TR-73	09	AD-450 300
WILDLIFE-79	08	PB-167 522
WILDLIFE-81	06	PB-167 523
WILDLIFE-82	06	PB-167 524
WILDLIFE-83	06	PB-167 525
WILDLIFE-84	06	PB-167 526
WILDLIFE-86	06	PB-167 527
WILDLIFE-88	06	PB-167 528
WILDLIFE-89	06	PB-167 529
05361-9-T	09	AD-450 300
06334-1-T	04	PB-167 549
1797	06	AD-436 809
2	10	AD-290 326
2272	22	PB-167 393
2644-63	09	AD-403 528
378	17	PB-167 547

FORM NBS-811 (2-68) U.S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS

CLEARINGHOUSE ORDER FORM

TO: Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151

SHIP TO *(If different than sold to)*

SOLD TO *(Name or firm)*

STREET ADDRESS

CITY AND STATE *(Include zip code)* OR CITY AND COUNTRY

DEPOSIT ACCOUNT NO. *(If any)*

YOUR ORDER NO.

DATE

ACCESSION/REPORT NUMBER OR TITLE	TYPE HC/ MF*	QUANTITY	UNIT PRICE	TOTAL PRICE	FOR CFSTI USE: ACTION CODE	VERIFIED BY	EXTRACTED BY	EXTRACTED DATE

IF ADDITIONAL SPACE IS NEEDED, PLEASE ATTACH ANOTHER ORDER FORM

PLEASE INDICATE METHOD OF CASH PAYMENT ☐ CHECK ☐ MONEY ORDER →

MAKE CHECK OR MONEY ORDER PAYABLE TO NATIONAL BUREAU OF STANDARDS - CFSTI

AMOUNT ENCLOSED

$

* Type of copy - **HC** stands for Hard Copy
MF stands for Microfiche

USCOMM-DC 26204-P68

U. S. DEPARTMENT OF COMMERCE FIELD OFFICES
PROVIDE READY ACCESS TO COMMERCE SERVICES

- The Department of Commerce maintains Field Offices in the cities listed below for the purpose of providing ready access to the reports, publications, and services of the Business and Defense Services Administration, Bureau of International Commerce, Clearinghouse for Federal Scientific and Technical Information, Office of Business Economics, and the Bureau of the Census. Information on activities of the National Bureau of Standards, Patent Office, and the Area Redevelopment Administration is also available.
- Experienced personnel will gladly assist in the solution of specific problems, explain the scope and meaning of regulations administered by the Department, and provide practical assistance in the broad field of domestic and foreign commerce. Field offices act as official sales agents of the Superintendent of Documents and stock a wide range of official Government publications relating to business. Each office maintains an extensive business reference library containing periodicals, directories, publications, and reports from official as well as private sources.
- Approximately 600 Chambers of Commerce, Manufacturers Associations, and similar business groups are official Cooperative Offices of the Department where many of the basic publications and reports of the Department are on file and available for consultation. If specific information is not on hand in the Cooperative Office, your problem will be referred to the nearest Department field office.
- These facilities have been established to assist you. You are invited to use them.

DOMESTIC TRADE

Population Count and Characteristics
Housing Statistics
Detailed Agricultural Data on County Basis
Retail, Wholesale and Service Business
Estimates on Population Movements
National Income Statistics
Regional Trends in United States Economy
Biennial Volume on Business Statistics
Current Releases and Business Indicators
Research Sources on Market Potentials
Development and Maintenance of Markets
Reports on Governmental and Private Technical Research
Regional and Community Development Techniques
Information on Government Procurement, Sales and Contracts

FOREIGN TRADE

Tariff Rates of Foreign Countries on Specific American Products
Regulations Bearing on the Control of Exchange Abroad
Administration of Regulations Imposing Import Quotas and the Details of Import Licensing Procedures in Overseas Markets
Facts on Economic and Trade Conditions
Business Information on Foreign Firms
Documentation of Export and Import Shipments, Both Here and Abroad
Statistical Data on Both Imported and Exported Products
Assistance on Export Regulations and Problems, Including Prompt Special Service in Emergency Situations
Trade Investment and Licensing Opportunities
Foreign Lists of Buyers and Suppliers

Department Field Offices

Albuquerque, N. Mex., 87101, U.S. Courthouse. 247-0311.
Anchorage, Alaska, 99501, Room 306, Loussac-Sogn Building. Phone: BR 2-9611.
Atlanta, Ga., 30303, 75 Forsyth St., N.W. 526-6000.
Baltimore, Md., 21202, 305 U.S. Customhouse, Gay and Lombard Streets. Phone: PLaza 2-8460.
Birmingham, Ala., 35203, Title Bldg., 2030 Third Ave., North. Phone: 325-3131.
Boston, Mass., 02110, Room 230, 80 Federal Street. CApitol 3-2312.
Buffalo, N.Y., 14203, 504 Federal Building, 117 Ellicott Street. Phone: 842-3208.
Charleston, S.C., 29401, No. 4, North Atlantic Wharf. Phone: 722-6551.
Charleston, W. Va., 25301, 3002 New Federal Office Building, 500 Quarrier Street. Phone: 343-6196.
Cheyenne, Wyo., 82001, 207 Majestic Bldg., 16th & Capitol Ave. Phone: 634-5920.
Chicago, Ill., 60604, 1486 New Federal Building, 219 South Dearborn Street. Phone: 828-4400.
Cincinnati, Ohio, 45202, 8028 Federal Office Building, 550 Main Street. Phone: 381-2200.
Cleveland, Ohio, 44101, 4th Floor, Federal Reserve Bank Bldg., East 6th St. & Superior Ave. 241-7900.
Dallas, Tex., 75202, Room 1200, 1114 Commerce Street. RIverside 9-3287.
Denver, Colo., 80202, 142 New Custom House, 19th & Stout Street. Phone: 297-3246.
Des Moines, Iowa, 50309, 1216 Paramount Building, 509 Grand Avenue. Phone: 284-4222.
Detroit, Mich., 48226, 445 Federal Bldg. 226-6088.
Greensboro, N.C., 27402, Room 412, U. S. Post Office Building. 275-9111.
Hartford, Conn., 06103, 18 Asylum St. Phone: 244-3530.
Honolulu, Hawaii, 96813, 202 International Savings Bldg., 1022 Bethel Street. Phone: 588667.
Houston, Tex., 77002, 5102 Federal Bldg., 515 Rusk Ave. CA 8-0611.
Jacksonville, Fla., 32202, 512 Greenleaf Building, 208 Laura Street. ELgin 4-7111.
Kansas City, Mo., 64106, Room 2011, 911 Walnut Street. BAltimore 1-7000.
Los Angeles, Calif., 90015, Room 450, Western Pacific Building, 1031 S. Broadway. 688-2833.
Memphis, Tenn., 38103, 345 Federal Office Building, 167 N. Main Street. Phone: 534-3214.
Miami, Fla., 33130, 1628 Federal Office Bldg., 51 S.W. First Avenue. Phone: 350-5267.
Milwaukee, Wis., 53203, Straus Bldg., 238 W. Wisconsin Avenue. Phone: BR 2-8600.
Minneapolis, Minn., 55401, Room 304, Federal Bldg., 110 South Fourth Street. Phone: 334-2133.
New Orleans, La., 70130, 909 Federal Office Building (South), 610 South Street. Phone: 527-6546.
New York, N. Y., 10001, 61st Fl., Empire State Bldg., 350 Fifth Avenue. LOngacre 3-3377.
Philadelphia, Pa., 19107, Jefferson Building, 1015 Chestnut Street. 597-2850.
Phoenix, Ariz., 85025, New Federal Bldg., 230 N. First Avenue. Phone: 261-3285.
Pittsburgh, Pa., 15219, Room 2201, Federal Building, 1000 Liberty Avenue. Phone: 644-2850.
Portland, Oreg., 97204, 217 Old U. S. Courthouse, 520 S. W. Morrison Street. 226-3361.
Reno, Nev., 89502, Room 2028, 300 Booth Street. Phone: 784-5203.
Richmond, Va., 23240, 2105 Federal Building, 400 North 8th Street. Phone: 649-3611.
St. Louis, Mo., 63103, 2511 Federal Building, 1520 Market Street. MAin 2-4243.
Salt Lake City, Utah, 84111, 3235 Federal Building, 125 South State Street. 524-5116.
San Francisco, Calif., 94102, Federal Building, Box 36013. 450 Golden Gate Avenue. Phone: 556-5864.
Santurce, Puerto Rico, 00907, Room 628, 605 Condado Avenue. Phone: 723-4640.
Savannah, Ga., 31402, 235 U. S. Courthouse and Post Office Bldg., 125-29 Bull Street. 232-4321.
Seattle, Wash., 98104, 809 Federal Office Bldg., 909 First Avenue. MUtual 2-3300.

UNIVERSITY MICROFILMS INC
313 N FIRST STREET
ANN ARBOR MICHIGAN
GRR JUNE

UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D.C. 20402

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. GOVERNMENT PRINTING OFFICE

The Clearinghouse Announces . . .

the regularly monthly publication of the **Government-Wide Index to Federal Research and Development Reports,** providing scientists, engineers, librarians and management with a single reference guide to new unclassified Government-sponsored R and D in the physical sciences, engineering and related technology.

The *Government-Wide Index* is compiled each month by computer manipulation of indexing records from the previous month of the following four agency announcement journals:

Nuclear Science Abstracts, Atomic Energy Commission

Scientific and Technical Aerospace Reports, National Aeronautics and Space Administration

Technical Abstract Bulletin, Defense Documentation Center

U. S. Government Research and Development Reports, Clearinghouse for Federal Scientific and Technical Information

The *Government-Wide Index to Federal Research and Development Reports* is printed and sold by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402. Price is $10 for a one-year subscription (12 issues); add $2.50 for foreign mailing; single issue, $1.25. Make remittance payable to Superintendent of Documents.